Attachment 10 – Proponent's Detailed Site Investigation (Contamination) Report - 36 Lonsdale Street, Lilyfield

OZZY STATES PTY LTD

DETAILED SITE INVESTIGATION REPORT
36 LONSDALE STREET, LILYFIELD, NSW

Report E22390 AB
24 March 2015

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

REPORT DISTRIBUTION

Detailed Site Investigation Report
36 Lonsdale Street, Lilyfield, NSW

EI Report No.: E22390 AB
Date: 24 March 2015

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EXECUTIVE SUMMARY

Background

Ozzy States Pty Ltd engaged Environmental Investigations Australia Pty Ltd (EI) to conduct a Detailed Stage 2 Site Investigation Report (DSI) for the property located at 36 Lonsdale Street, Lilyfield, NSW ('the site').

A Preliminary Stage 1 Site Investigation Report (PSI) for this site has been previously completed by EI and is presented separately in the report referenced E22390 AA Rev 1. The PSI incorporated a desktop assessment and historical records search including a search of Workcover records for dangerous goods and fuel storage infrastructure, and review of available environmental reports for the site. Further investigation involving a Stage 2 Detailed Site Investigation (DSI) was recommended in order to assess the environmental conditions and the potential for on-site contamination associated with the identified current and former land uses.

This environmental assessment was completed as part of a development application process through Leichhardt Municipal Council to allow site development for mixed, multi-storey, residential and commercial/retail land uses.

Objectives

The main objectives of the assessment were to:

- Characterise site environmental conditions in relation to the nature, degree and sources of any soil 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 comprises a 0.96 hectare area occupied by a single level brick warehouse and offices. The property was bound directly to the east by retail, residential areas to the west and south, while to the north is the City West Link roadway and the Metro Light Rail Line.
- A previous Preliminary Site Investigation Report had been completed by EI in February 2015 (Ref. E22390 AA – Rev 1), which indicated that the site has been subject to some commercial/industrial use since at least 1917 and included UST filling points on Lonsdale Street.
- Soil sampling and testing were conducted at seven borehole locations down to a maximum depth of 1.5 mBGL.

- The sub-surface layers comprised fill materials of various constituents to a maximum depth of 1.2 mBGL, including minor ash and hydrocarbon odours. The overall geological configuration within the site was anthropogenic fill underlain by Hawkesbury Sandstone bedrock.
- Groundwater was encountered at approximately 1.8 mBGL during sampling single groundwater monitoring event on 9.3.2015.
- Laboratory testing of selected soil samples from both the fill and undelying natural soils indicated exceedances of the adopted health-based investigation/screening levels in relation to the following analytes:
  - The heavy metals copper and zinc at concentrations exceeding adopted ecological criteria in site fill;
  - B(α)P TEQ exceedances in sampling location BH2 and BH6 within the fill layer;
  - Benzo(a)pyrene in fill at BH2, BH5 and BH6 exceeding ecological criteria; and
  - Total recoverable hydrocarbon (TRH) fraction F3 exceeding the ecological criterion in fill at BH2.
- Testing of groundwater sampled at MW1 identified concentrations in excess of the adopted groundwater investigation criteria:
  - The heavy metals arsenic, chromium, nickel and zinc;
  - TRH fraction F1; and
  - PAH benzo(a)pyrene concentrations.

In summary, soil impacts were identified as being constrained within the fill layer at locations BH2, BH5 and BH6, which may have been present in the fill prior to importation to the site, or may have resulted from past, on site activities.

Groundwater was found to be generally consistent with regional impacts in the Sydney, urban-industrial setting with regards to heavy metals; however, TRH F1, PAH and VOC were also potentially identified. Further investigation and assessment of groundwater after the demolition stage is considered warranted to delineate the extent of impacted groundwater, assess risks to site users and/or the environment and to inform any subsequent remedial action, if required.

Conclusions and Recommendations

Based on the findings of the DSI and with consideration of the Statement of Limitations (Section 12), EI concludes that although widespread contamination was not identified at the site, the site can be made suitable for the proposed commercial and residential uses, after carrying out the following data gap closure investigations and any subsequent site management and remedial actions that may be found to be warranted:

1. Preparation of a Remedial Action Plan (RAP) to outline remediation requirements for contaminated soils and groundwater. The RAP should include further soil and groundwater investigations to close outstanding data gaps, including:
   a) Remediation and validation of soils surrounding all identified UPSS infrastructure;
   b) Remediation, waste classification of impacted soils from the UPSS areas and other areas of the site;

c) Installation of three additional groundwater wells with at least one additional round of groundwater sampling and laboratory analysis for the relevant chemicals of concern;

d) A well elevation survey followed by an assessment of hydraulic gradient, aquifer hydraulic conductivity and groundwater flow direction; and

e) An assessment of risks to site users and/or the environment, should groundwater contamination be confirmed.

2. Due to the restricted site access caused by the presence of tenants and structures, additional works required as part of the RAP should be conducted once the site has either been vacated or once demolition of structures has been completed;

3. Any material being removed from site (including virgin excavated natural materials or VENM) must be classified for off-site disposal with an accompanying Waste Classification Certificate provided by a suitably qualified and experienced environmental scientist, in accordance the EPA (2014) Waste Classification Guidelines.

4. Any material being imported to the site should be assessed (validated) for potential contamination in accordance with NSW EPA guidelines as being suitable for the intended land use or be certified in accordance with EPA (2014) as VENM or ENM.

5. Any dewatering activity necessary for excavation of basement car parking will require the appropriate approvals from Council and Sydney Water including ongoing groundwater disposal monitoring.

6. Validate that remediated areas are left free of contamination by comparing analytical results for excavation surfaces and any backfill material, against the adopted Remediation Criteria.

7. Preparation of a final site validation report by a qualified environmental consultant, certifying the suitability of the site for the proposed development.

In conclusion and within the Statement of Limitations, EI concludes that the site can be made suitable for the proposed development, subject to the recommendations provided. Site contamination issues can be managed through the development application process in accordance with the State Environmental Planning Policy 55 (SEPP 55) – Remediation of Land and the Leichhardt Municipal Council Contaminated Land Policy.

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Mr Remolo Negro of Ozzy States Pty Ltd engaged Environmental Investigations Australia Pty Ltd (EI) to conduct a Detailed Site Investigation (DSI) for site characterisation purposes for 36 Lonsdale Street, Lilyfield, NSW ('the site').

As presented in Figure 1, the site Project is located approximately 4 km west of the Sydney central business district. The site is situated within the Local Government Area of Leichhardt Municipal Council and covers a total area of approximately 0.96 ha (966 m2), as depicted in the site plan presented as Figure 2.

This assessment was conducted in support of a Development Application (DA) to Leichhardt Municipal 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. It is also understood that this Phase 1 assessment is to accompany the development application lodgement package to Leichhardt Municipal Council.

A Preliminary Site Contamination Investigation Report (PSI, February 2015) for this site has previously been completed by EI and is presented separately in the report referenced E22390 AB. The PSI incorporated site walkover observation, a desktop assessment involving historical records search, and review of other available environmental reports for the site.

A Preliminary Geotechnical Investigation was also undertaken by EI in conjunction with the DSI. This report is presented separately in the report referenced E22390 GA Rev 1. The PGI report provides geotechnical advice and recommendations for the preparation of the designs for the proposed residential development. The GI report should be read in conjunction with this report.

This assessment was 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

Based on the proposed development plans provided by the client (Ref. Derek Raithby Architecture, dated Jan 2015), the proposed site redevelopment will involve demolition of existing infrastructure and erection of a multi-storey mixed use residential building, ground level retail / commercial uses and basement car parking. Concept plans for the proposed development (including landscape plans) are provided in Appendix A.

It is also understood that a two level basement car park for the development will extend to a depth of approximately 7.5m BGL.

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*;
- NSW EPA (1997) *Contaminated Land Management Act*;
- State Environment Protection Policy 55 (SEPP 55) – Remediation of Land; and
- OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*.

1.4 PROJECT OBJECTIVES

The primary objectives of this investigation were to:

- To investigate and quantify the degree of any potential contamination by means of intrusive sampling and laboratory analysis, for relevant contaminants; and
- Where site contamination is confirmed, make recommendations for the appropriate management of contaminated soils and/or groundwater.

1.5 SCOPE OF WORKS

In order to achieve the above objectives and in keeping the project cost-effective while generally complying with the OEH (2011) guidelines for consultants reporting on contaminated sites, the scope of works was as follows:

1.5.1 Desktop Study

- A review of the previous Phase 1 Preliminary Site Investigation Report prepared by EI in February 2015 (Ref. PSI, 2015);
- A review of existing underground services on site;
- Preparation of a Work, Health, Safety & Environment Plan and quality assurance and quality control measures (QA/QC);

1.5.2 Field Work & Laboratory Analysis

- A detailed site walkover inspection;
- Drilling of test boreholes at seven locations (BH1 to BH7) distributed in a targeted pattern across accessible areas of the site;
- Installation of one groundwater monitoring well to a depth of 3.7 mBGL, 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 wells; 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 program.

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	36 Lonsdale Street, Lilyfield, NSW 2040
Location Description	The site comprises a single level brick warehouse and office spaces. The property directly to the east is zoned B2 (Local Centre), the areas to the west and south are zoned R1 (General Residential), while to the north is the City West Link roadway and the Metro Light Rail Line.
Site Area	960 m^2
Site Owner	Ballasal Pty Limited
Lot and Deposited Plan (DP)	Lots 18, 19 & 20 in DP 977323
State Survey Marks	SS25270D is located on the north eastern corner of the site.
Local Government Authority	Leichhardt Municipal Council
Parish	Petersham
County	Cumberland
Current Zoning	General Residential

2.2 SURROUNDING LAND USE

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

Table 2-2 Surrounding Land Use

Direction Relative to Site	Land Use Description
North	City West Link, a major arterial road which is a Transport for NSW Roads and Maritime Services (RMS) asset. Beyond City West Link are the Metro Light Rail, Lilyfield Light Rail Stop and former Rozelle Goods Yard.
East	Lonsdale Street, with a mixed use building (IGA and residential apartments) with basement car parking opposite and one to two-storey residential buildings.
South	One to two-storey, brick residential developments.
West	One to two-storey residential buildings.

The nearest sensitive environmental receptors are the residential properties surrounding the site on three sides.

2.3 REGIONAL SETTING

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

Table 2-3 Regional Setting Information

Attribute	Description
Ground Topography	The site is on a minor slope trending toward a former drainage line. Local topography slopes downwards to the northeast, at approximately 5 to 10°. There is significant urban development around the site, with a deep sandstone cutting for the Light Rail and associated Lilyfield Station 50m to the north of the site. Elevation for the site is between RL 18 to 14 mAHD.
Site Drainage	As the site is comprised predominantly of hardstand pavement, site drainage is expected to discharge to the municipal stormwater system
Regional Geology	Information on regional sub-surface conditions, referenced from the Department of Mineral Resources Geological Map Sydney 1:100,000 Geological Series Sheet 9130 (DMR 1991) indicates the site to be underlain by Hawkesbury Sandstone, which typically comprises medium to coarse grained quartz sandstone, very minor shale and laminite lenses.
Soil Landscapes	The Soil Conservation Service of NSW Sydney 1:100,000 Soil Landscapes Series Sheet 9130 (2nd Edition) indicates that the erosional landscape at the site likely comprises the Gymea Landscape. The Gymea landscape soils are shallow to moderately deep (30-100 cm) yellow earths and earthy sands on crests and inside of benches; shallow (<20 cm) siliceous sands on leading edges of benches; localised gleyed podzolic soils and yellow podzolic soils on shale lenses; shallow to moderately deep (<100 cm) siliceous sands and leached sands along drainage lines.
Acid Sulphate Soil Risk	In accordance with the Leichhardt Local Environmental Plan 2013 Acid Sulfate Soils Map – Sheet ASS_004, the site is classified as Class 5 for Acid Sulfate Soils (ASS). Category 5 sites require development consent where works within 500 m of adjacent Class 1,2,3 or 4 land are below 5 mAHD are likely to lower the water table below 1 mAHD. As the local geology is Hawkesbury Sandstone ASS are unlikely to be present.
Likelihood & Depth of Site Filling	Based on site observations reported in the PSI (Feb 2015), site fill is like to extend to depths of approximately 1.50 mBGL, however, the total depth of fill may be reduced in some areas of the site.
Typical Soil Profile (Summary of lithology from EI (2015))	Concrete hardstand over clayey sand and sand fill with some gravel including brick and sandstone, overlying distinctly to slightly weathered or fresh with depth, medium to coarse grained.
Depth to Groundwater	No Groundwater seepage inflows were observed during the geotechnical investigations (EI, 2014), however the standing water level was recorded as 2.7 mBGL on 11 December 2014.
Aquifer Types / Estimated Thickness	The groundwater includes intermittent seepage zones that may be present in the fill layer and deeper groundwater moving through fractures, joints and bedding planes within the underlying sandstone bedrock.
Nearest Surface Water Feature	The nearest surface water is Johnstons Bay; a part of Sydney Harbour, approximately 950 m to the northeast. This part of the river is considered to be tidally influenced and is therefore classed as a marine water ecosystem.
Groundwater Flow Direction	Groundwater flow direction in the vicinity of the site is inferred to be Johnstons Bay; a part of Sydney Harbour, approximately 950 m to the northeast).

Attribute	Description
Hydraulic Gradient	Unknown
Hydraulic Conductivity	Unknown
Aquifer Porosity	Unknown
Groundwater Seepage Velocity	Unknown
Groundwater Salinity	Inferred to be low. Groundwater electrical conductivity (EC) measured at MW1 (reported as 977-1489 uS/cm)

2.4 GROUNDWATER BORE RECORDS AND LOCAL GROUNDWATER USE

An online search was conducted using the NSW Natural Resource Atlas (NR Atlas), which records relevant information pertaining to all licensed water bores for the state of New South Wales, revealed one (1) registered monitoring bore located within 500 m of the site. No groundwater details were available from NR Atlas at the time of this report.

2.5 SITE WALKOVER INSPECTION

Ms Sari Eru (EI, Environmental Scientist) made a number of observations during a detailed walkover inspection of the site on 6 January, 2015:

- The site comprised a trapezoidal shaped block of land, situated on the corner of Lonsdale Street and the City West Link Road. The block comprised a high roofed commercial warehouse with offices with concrete flooring throughout.
- The site topography was sloping down to the north with site drainage expected to flow to the local street stormwater system.
- The site was tenanted by two commercial businesses eing *Australian Prestressing* in the northern portion and *Pacific components Pty Ltd* in the southern portion. Anecdotal evidence was noted from *Australian Prestressing* that the northern part of the site was formerly used as a workshop before being converted to office space in the last two-three years.
- The warehouse was built from brick and was in relatively good condition with minimal weathering of painted surfaces and / or metallic surfaces observed.
- Condition of suspected corrugated fibreboard roofing (potentially containing Asbestos fibres) were not able to be closely examined due to height/access restriction.
- Evidence of an existing underground petroleum storage system (UST filling points) were observed at the eastern boundary on Lonsdale Street as shown in Figure 2.

3. PREVIOUS INVESTIGATIONS

A previous investigation was undertaken by EI in February 2015, the findings of which were documented in the report titled "Preliminary Site Investigation Report (PSI), 36 Lonsdale Street, Lilyfield NSW", Report No. E22390 AA Rev 1, dated 20 March 2015.

A summary of key findings and recommendations of the PSI is outlined in Table 3-1.

Table 3-1 Summary of Previous Investigation Works and Findings

Assessment Details	Project Tasks and Findings
Work Objectives	The primary objective of the PSI were to: • Evaluate the potential for site contamination on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources. • The assessment would also provide some indication of the additional works that would be required to achieve adequate site characterisation, as required under the NEPM 2013 guidelines.
Scope of Works	The scope of works comprised a desk study including: • A review of relevant topographical, geological, hydrogeological and soil landscape maps for the project area; • Review of a previous environmental report for the site by Environmental Investigation Services (ref. *Environmental Site Screening for Proposed Residential/Commercial Development,* ref: E12514f.RPT, dated 16 May 1997); • Search of historical aerial photographs archived at NSW Land and Property Information in order to review previous site use and the historical sequence of land development in the neighbouring area; • A land titles search, also conducted through NSW Land and Property Information for information relating to site ownership; • Site history survey involving a detailed search of Leichhardt Council records for information relating to operational site history and/or relevant environmental incidents; • A search through the NSW EPA / OEH Land Information records to confirm that there are no statutory notices current on the site under the Contaminated Land Management Act (1997); • A search of the Stored Chemical Information Database (SCID) and microfiche records held by WorkCover NSW relating to possible underground tank approvals and locations; • A review of existing underground services on site; • A detailed site walkover inspection.
Site background	Historical search information suggested that the site was in use for commercial / industrial purposes since at least 1917. Further detail of specific industrial activities or potential contamination sources was reported as uncertain.

Assessment Details	Project Tasks and Findings
Conclusions	EI concluded that: • The historical review of available information for the site was inconclusive as limited documented information was available regarding former commercial or industrial activities conducted onsite; • The site was free of statutory notices issued by the NSW EPA/OEH; • WorkCover search indicated that the site was not listed as containing a UST, however the EIS (1997) report indicated that a UST was present onsite. The EIS report states: "*Pipes were traced back from the fill points located in Lonsdale Street to the tank. The tank is approximately 2 m in diameter and is known to contain hydrocarbon product*." • Previous EIS (1997) investigation identified hydrocarbon and heavy metal impacted soils on site; and • The depth to groundwater is assumed to be approximately 3 mBGL and groundwater flow direction is assumed to be in a northerly direction.
Recommendations	The following recommendations were made for the site should proposed residential redevelopment proceed: • EI considered that there is potential for site contamination and complete exposure pathways to be present onsite under current and future site configurations that requires further investigation. • EI considered that a Detailed Site Investigation (DSI) should be performed, comprising intrusive soil and groundwater investigation to quantify potential site contamination and exposure risks. • The DSI should be undertaken in accordance with guidelines made or approved by the NSW EPA under section 105 of the CLM Act.

4. CONCEPTUAL SITE MODEL

In accordance with Schedule B2 – Guideline on Site Characterisation of the National Environmental Protection (Assessment of Site Contamination) Measure 1999 Amendment 2013 (NEPM 2013) 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, search findings and limited soil sampling as reported in the EIS investigation (1997) as described in Section 3, 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 and current industrial and/or commercial activities at the site, including the handling and storage of hydrocarbon fuels in the identified UPSS;
- Spills and leaks from parked vehicles or machinery;
- Weathering of painted, structural surfaces (buildings), historically and currently;
- Hazardous materials, including potential asbestos-containing materials (ACM) from building products used onsite;
- Previously identified heavy metals, TRH, BTEX and PAH impacted fill;
- Deeper, natural soils containing residual impacts, representing potential secondary sources of contamination; and
- Impacts that may have migrated onto the site from unknown, offsite contamination sources.

4.2 CHEMICAL 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 (HM), total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAH), the monocyclic aromatic hydrocarbon compounds benzene, toluene, ethyl benzene and xylenes (BTEX), organochlorine and organophosphate pesticides (OCP/ OPP), polychlorinated biphenyls (PCB) and asbestos.
- Groundwater – HM, TRH, BTEX, PAH, and volatile organic compounds (VOC) including chlorinated VOC (VOCC) such as trichloroethylene (TCE).

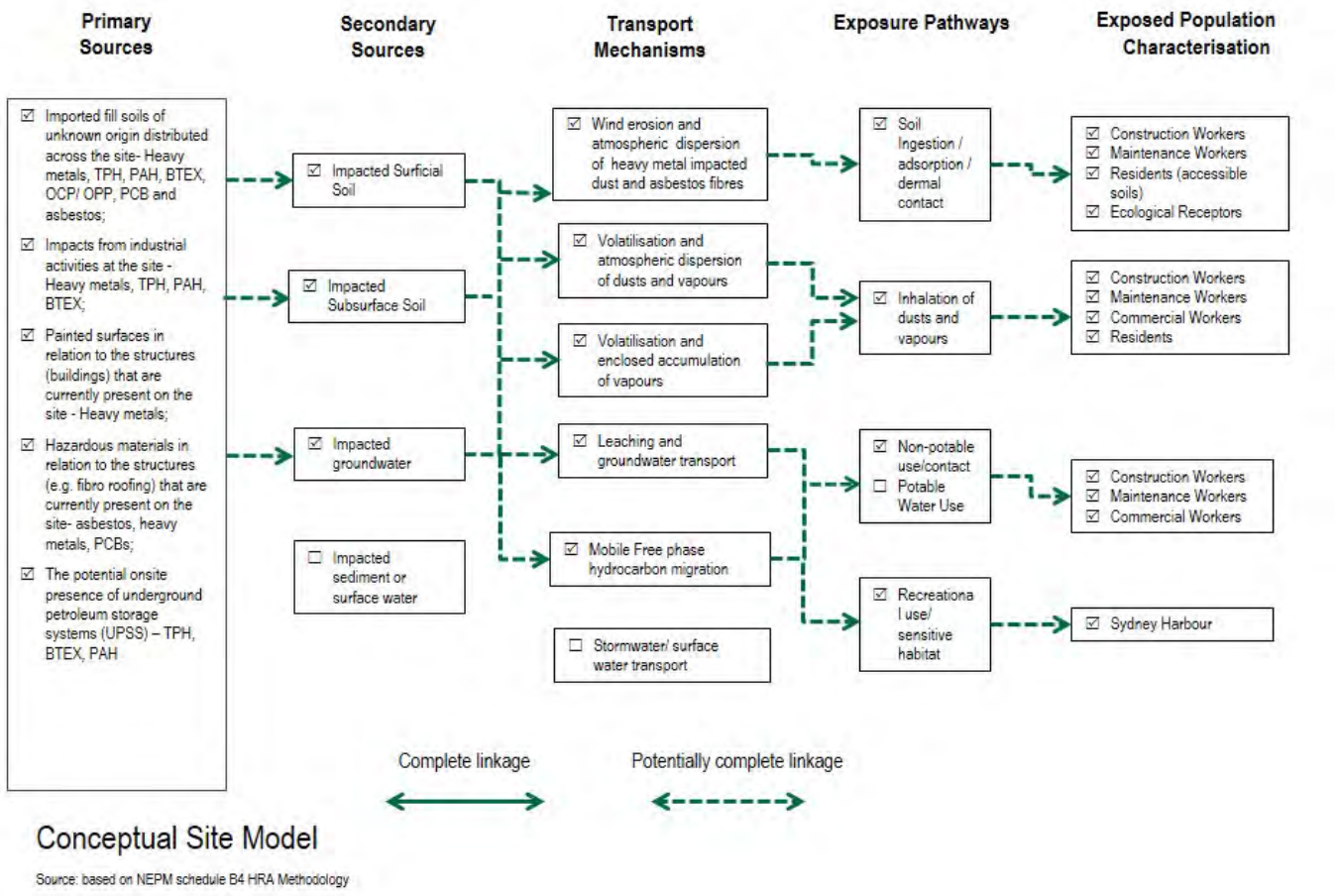
4.3 POTENTIAL SOURCES, EXPOSURE PATHWAYS AND RECEPTORS

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.

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.

Figure 4 – Preliminary Conceptual Site Model



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 DSI;
- Investigation methodology including media to be sampled, details of analyses 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)	US EPA (2006) (modified)	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.	Give a concise description of the problem. Develop a conceptual model of the environmental hazard to be investigated. Identify resources available.	The site is designated to be redeveloped into a mixed commercial/residential use multi-storey apartment block including retail use on ground floor, over a two level car park basement. The site has been historically used for some industrial purposes followed by commercial warehouses. Possible contamination could derive from these former site uses, as well as possible contamination from spills / leaks of parked cars and loading areas; building material weathering, hazardous materials (including potential ACM), subsurface infrastructure (UPSS), and contamination and filling material of unknown origin and quality. Previous limited sampling on site identified impacted fill soils; however to meet the required sampling density further investigation needs to be undertaken.	-
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	Identify principal study question(s). Consider alternative outcomes or actions that may result from answering the question(s). For decision problems, develop decision statement(s), organise multiple decisions. For estimation problems, state what needs to be estimated and key assumptions.	Intrusive environmental soil and groundwater sampling and laboratory analysis is required to assess if contamination is present. Furthermore, this investigation will provide information to develop a decision on the site suitability for the intended mixed commercial/residential development.	-

DQO Steps (NSW DEC, 2006)	US EPA (2006) (modified)	Details	Comments (changes during investigation)
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements	Identify types and sources of information needed to resolve decisions or produce estimates. Identify the basis of information that will guide or support choices to be made in later steps of the DQO Process. Select appropriate sampling and analysis methods for generating the information.	The main inputs to the environmental investigation works include: Identification of historic potential contamination on site; derived from the preliminary site investigation and identified impacted fill soils (Section 3); National and NSW EPA guidelines under the NSW Contaminated Land Management Act 1997. Seven (7) borehole sampling locations were selected using a targeted sampling pattern across accessible areas of the site. An additional bore hole location was utilised for the installation of a groundwater monitoring well. Laboratory analysis of subsurface and deeper soils, and groundwater. National and NSW EPA guidelines under the NSW Contaminated Land Management Act 1997.	BH1, BH3, BH4, BH5 & BH6 refused in shallow Sandstone bedrock. Borehole BH2 refused below sandstone bedrock on concrete (suspected retaining wall cavity filling). BH7 refused on buried concrete slab preventing access and sampling of natural soils.
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	Define the target land-use and receptors of interest and its relevant spatial boundaries. Define what constitutes a sampling unit. Specify temporal boundaries and other practical constraints associated with sample/data collection. Specify the smallest unit on which decisions or estimates will be made.	Lateral – the site is located on the corner of City West Link Road and Lonsdale Street and is surrounded by a mix of residential, transportation and retail land uses; Vertical – from the existing ground level to at least the base of the proposed excavations at approximately 7.5 mBGL; Temporal – The findings of this assessment will hold true for as long as the site use remains passive in nature; that is, for as long as the site is used for residential uses and retail uses and there are no activities taking place onsite or on immediately adjacent (upgrading) properties that may compromise onsite environmental conditions.	
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	Specify appropriate land-use parameters for making decisions or estimates. For decision problems, choose a workable Action Level and generate an "If then else" decision rule which involves it. For estimation problems, specify the methodology and the estimation procedure.	The decision rules for the investigation were: • If the concentrations of contaminants in the soils data exceed adopted land use criteria; then assess the need to further investigate the extent of impacts onsite and select appropriate remedial methods. • Decision criteria for QA/QC measures are defined by the Data Quality Indicators (DQI) in Table 5-2.	

DQO Steps (NSW DEC, 2006)	US EPA (2006) (modified)	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	For decision problems, specify the decision rule as a statistical hypothesis test, examine consequences of making incorrect decisions from the test, and place acceptable limits on the likelihood of making decision errors. For estimation problems, specify acceptable limits on estimation uncertainty.	Specific limits for this project were in accordance with the appropriate guidance made by the NSW EPA, appropriate indicators of data quality and standard procedures for field sampling and handling. This should include the following points to quantify tolerable limits: • A decision can be made based on a probability that 95% Upper Confidence Limits (UCL) 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. • A decision can be made based on the probability that a contamination hotspot of a certain circular diameter will be detected with 95% confidence using a selected density of systematic data points. The decision error will be limited to a probability of 5% that a contamination hotspot may not be detected. • 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	Compile all data and outputs generated in Steps 1 to 6. Use this information to identify alternative sampling designs that fit your intended use Select and document a design that will yield data to best achieve your data quality.	Written instructions will be issued to guide field personnel in the required fieldwork activities. Soil samples would be collected from accessible areas across the site and at targeted locations such as the suspected UPSS area and proposed landscape area to characterise the site's suitability for the intended land use. One round of groundwater sampling (minimum) would be performed at predefined monitoring well locations to assess groundwater conditions at the site.	

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 data quality assessment 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; and • Laboratory control samples.
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	To ensure the data produced by the laboratory 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 CSM described in Section 4, soil and groundwater investigation works were planned in accordance with the following rationale:

- Sampling fill and natural soils from seven test bore locations located systematically across accessible areas of the site using a targeted sampling pattern to characterise in-situ soils;
- Sampling groundwater during a single groundwater monitoring event (GME) at the newly installed monitoring well located in the former workshop area, to assess for potential groundwater impacts; and
- Laboratory analysis of representative soil and groundwater samples for the identified chemicals of concern.

6.2 INVESTIGATION CONSTRAINTS

Boreholes generally refused in sandstone bedrock during the drilling investigation at between 0.5 m and 1.6 mBGL. Variable conditions at BH7 however, resulted in refusal on a buried concrete slab at shallow depth (0.3m BGL) and BH2 refused below sandstone bedrock on concrete presumed to be retaining wall cavity filling. As such limited vertical delineation of fill materials was achieved. Detailed borehole logs, including monitoring well construction details are presented in Appendix C.

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.

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 presented as Tables T1 – T7, which are discussed in Section 8.

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-B thresholds for residential sites with minimal soil access as the northern portion of the site has been designated for residential with minimal soil access. Ecological Investigation Levels (EILs) Soil samples would also be assessed against the NEPM 2013 EILs for Urban residential and public open space land use for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene, which have been derived for protection of terrestrial ecosystems. 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) Soil samples to be assessed against the NEPM 2013 ESLs for Urban residential and public open space land use for petroleum hydrocarbons fractions, BTEX & the PAH benzo(a)pyrene 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	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 for the 95% level of protection of aquatic ecosystems; however, the 99% Trigger values were applied for the bio-accumulative metals *cadmium* and *mercury*. The marine criteria were considered relevant, as the closest potential surface water receptor was Johnstons Bay, a part of Sydney Harbour, located approximately 950 m to the northeast and known to be tidally influenced. Groundwater Investigation Levels (GILs) for Fresh Water NEPM 2013 provides also GILs for typical, slightly-moderately disturbed aquatic ecosystems, which are based on the ANZECC & ARMCANZ 2000 Trigger Values for the 95% level of protection of aquatic ecosystems. These criteria were also considered relevant for groundwater running both between and underneath the site and Johnstons Bay.
	NEPM, 2013 Groundwater HSLs for Vapour Intrusion	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 –high density residential sites were applied for groundwater.

Environmental Media	Adopted Guidelines	Rationale
	NEPM, 2013 GILs for Drinking purposes	Drinking Water GILs The NEPM (2013) GILs for drinking water quality were applied for specific parameters and were based on the Australian Drinking Water Guidelines (Ref. NHMRC, 2011). Johnstons Bay is likely to have recreational value; hence secondary contact recreation has been considered for receiving waters. To address secondary contact recreation, drinking water criteria have been multiplied by a factor of 10.

6.4 SOIL INVESTIGATIONS

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

Table 6-2 Summary of Soil Investigation Methodology

Activity/Item	Details
Fieldwork	The site investigation was conducted on 2 March 2015.
Drilling Method & Investigation Depth	Test bores BH1, BH2, BH3 and BH5 were drilled using a ute-mounted solid flight auger drilling rig using 100mm diameter augers. Test bore MW1 was drilled using a truck-mounted drill rig using solid flight augers equipped with a "tungsten-carbide" bit (T-C bit), followed by NMLC Diamond Coring from depths of 1.70 m to 7.68 mBGL for geotechnical purposes. Test bores BH4, BH6 and BH7 were drilled using a hand auger. Final bore depths were: 0.3 m to 0.7 mBGL for BH1, BH3, BH4, and BH6 (due to refusal on Sandstone); 1.6 mBGL and 0.3 mBGL for BH2 and BH7 respectively (refused on concrete); and 1.6 mBGL for BH5 (refusal on Sandstone). Boreholes MW1 was continued for geotechnical purposes using NMLC coring techniques from depths 3.7 mBGL to termination depth of 7.68 mBGL.
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 B.
Field Observations (including visual and olfactory signs of potential contamination)	A summary of field observations is provided, as follows: • Slight hydrocarbon odour was noted in the fill layer at BH1, BH2, BH5 (from 0.9 mBGL into natural Sandstone to refusal at 1.6 mBGL) ; and • Traces of ash were observed in fill layers at BH1, BH2, and BH6.
Soil Sampling	Soil samples were collected using grab/dry methods (stainless steel trowel) & placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars using dedicated nitrile gloves.
Decontamination Procedures	*Drilling Equipment* – Where a solid flight auger or a hand auger was used, the drilling rods were decontaminated between sampling locations with potable water until the augers were free of all residual materials. *Sampling Equipment* – Sampling equipment (i.e. trowel) was cleaned with suitable phosphate free detergent and rinsed with distilled water between sampling episodes.

Activity/Item	Details
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.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes.
Quality Control & Laboratory Analysis	Soil samples were submitted for analysis of previously-identified COPC by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes, as discussed in Section 7.
Soil Vapour Screening	Screening for potential VOCs in collected soil samples was conducted using a Photo-ionisation Detector (PID). However due to calibration failure and erroneous readings, PID results were not recorded on logs. The PID meter used has since been found to be overly moisture sensitive and due to age of the meter has been put out of service.

6.5 GROUNDWATER INVESTIGATIONS

The groundwater investigations conducted at the site are described in Table 6-3. Groundwater monitoring well locations are illustrated in Figure 2.

Table 6-3 Summary of Groundwater Investigation Methodology

Activity/Item	Details
Fieldwork	Groundwater monitoring well MW1 was installed and developed on 11 December 2015. Water level gauging, well purging, field testing and groundwater sampling was conducted on all site groundwater monitoring wells on 9 March 2015.
Well Construction	A single test bore was converted to a groundwater monitoring well MW1 to a depth of 3.7m in a partly down-gradient / targeted workshop location. • The Well was drilled by Traccess Drilling using a track-mounted, mechanical drilling rig equipped with solid flight augers and NLMC diamond core. Well construction details are tabulated in Table 8-2 and documented in the bore logs presented in Appendix B. MW1 was installed with a screen interval of 1.7 m to 3.7 mBGL (including 0.15 m sump) within the confined Sandstone aquifer.
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. MW1 was plugged with granular bentonite from 3.7 to 4.0 mBGL due to the presence of a void that had been created for the NLMC core sampling.
Well Development	Well development was conducted directly following installation. This involved agitation within the full length of the water column using a dedicated, HDPE, disposable bailer, followed by removal of water and accumulated sediment using a bailer. Bailing was continued to further reduce suspended sediment, which involved the removal of several well volumes.
Well Survey (Elevation and location)	Well elevations at ground level were extrapolated from spot height elevations marked on the survey plan provided by the Client (Appendix A). Well elevations at ground level were extrapolated in metres relative to Australian Height Datum (m AHD).
Well Gauging & Groundwater Flow Direction	Monitoring wells MW1 was gauged for standing water level (SWL, depth to groundwater) prior to well purging at the commencement of the GME on 9 March, 2015. The measured SWL is shown in Table 8-2. A transparent HDPE bailer was used to visually assess for the presence PSH prior to the commencement of well purging. PSH was not detected in the groundwater monitoring well, however dark colouration and hydrocarbon odour was noted. The direction of groundwater flow could not be determined from a single well, but was inferred from the sloping bedrock surface to be in a north-east direction toward Rozelle Bay (Sydney harbour).

Activity/Item	Details
Well Purging & Field Testing	Slight hydrocarbon odour was noted in MW1 during well purging. Measurement of water quality parameters was conducted repeatedly during well purging with water quality parameters recorded onto field data sheets (Appendix C) once water quality parameters stabilised. Groundwater was observed to be dark brown, with high turbidity. Field measurements for Dissolved Oxygen (DO), Reduction/Oxidation Potential (REDOX), Electrical Conductivity (EC) and pH of the purged water were also recorded during well purging. Purged water volumes removed from each well and field test results are summarised in Table 8-3.
Groundwater sampling	During groundwater purging once three consecutive field measurements were recorded to within ± 10% for DO, ± 10mV for REDOX, ± 3% for EC and ± 0.05 for pH, it was considered to indicate that groundwater representative of the formation water had been attained and final physico-chemical measurements were recorded. Groundwater was sampled using the MicroPurge, low-flow sampling system. 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 also included a MicroPurge QMP15 controller, which employed pressurised carbon dioxide gas to regulate groundwater flow. Pump pressure and pumping cycles were adjusted accordingly to regulate extraction flow rate, to avoid excessive drawdown of water level during the sampling process. The low-flow discharge method is used to minimise potential loss of volatile compounds.
Decontamination Procedure	The low-flow Micropurge™ pump used for purging and sampling and water level probe and water quality kit probes were decontaminated with a solution of potable water and Decon 90™ and rinsed with potable water between monitoring well locations. In addition, dedicated Micropurge™ pump bladders and HDPE tubing were utilised at each groundwater monitoring well location; therefore decontamination was not required for those items.
Sample Preservation	Sample containers were supplied by the laboratory with the following preservatives: • One, 500ml 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 D

7. DATA QUALITY ASSESSMENT

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 F. QA/QC policies and DQOs are presented in Appendix G.

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 and installation of the single monitoring well may be described as a layer of anthropogenic filling overlying Hawkesbury Sandstone bedrock. The geological information obtained during the investigation is summarised in Table 8-1 and borehole logs from these works are presented in Appendix B.

Table 8-1 Generalised Subsurface Profile (m BGL)

Layer	Description	Depth to top & bottom of layer (m BGL)
Concrete		0 – 0.2 (max 0.20 at BH1 & BH5)
Fill	Clayey SAND; fine to medium grained, brown/red/grey, poorly graded, clay medium plasticity & inferred stiff, no odour (hydrocarbon odour beyond 0.9 m at BH5);	0.2 – 1.2 (at BH5)
	SAND, fine to medium grained, yellow to orange, no odour;	0.15 – 0.3 (at BH7)
	Gravelly SAND; fine to medium grained, brown-dark brown, poorly graded, gravel is fine to coarse, trace ash, hydrocarbon odour at BH1 & BH2;	0.12 – 0.7 (at BH6)
Residual Soil	SAND; fine to medium grained, yellow – orange, poorly graded, no odour;	0.15 – 0.4 (at BH4)
Bedrock	Inferred extremely – distinctly weathered Hawkesbury Sandstone, yellow grey, inferred low-medium strength, no odour (except mild hydrocarbon odour at BH5)	Min. 0.4 (BH3) – 7.68 (MW1)

8.1.2 Field Observations and PID Results

Soil samples were obtained from the test bores at various depths ranging between 0.15 m to 1.5 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, etc.) and the following observations were noted:

- Slight hydrocarbon odour was noted in the fill layer of borehole location BH1, BH2 and BH5 (beyond 0.9m into “stained” natural Sandstone);
- Traces of ash were observed in the fill layer of borehole locations BH1, BH2 and BH6;
- Fibrous cement sheeting was not observed in fill soils at any sampling location;
- Ash, charcoal, coal or slag was not observed in fill soils at the remaining test bores; and

- Soil headspace samples were field-screened using a portable PID, fitted with a 10.6 eV lamp; however due to calibration failure and erroneous readings, PID results were not recorded onto logs. The PID meter used has since been found to be overly moisture sensitive and due to age of the meter has been put out of service.

8.2 GROUNDWATER INVESTIGATION RESULTS

8.2.1 Monitoring Well Construction

A single borehole was converted to groundwater monitoring wells MW1, located as shown in Figure 2. Well construction details for the installed groundwater monitoring well is summarised in Table 8-2.

Table 8-2 Monitoring Well Construction Details

Well ID	Bore Depth (m BGL)	Screen Interval (m BGL)	Lithology Screened
MW1	3.7	1.7 – 3.55 (0.15m bottom sump)	SANDSTONE Bedrock

Notes:
m BGL = metres below ground level.

8.2.2 Field Observations and Water Test Results

A single GME was conducted on the newly installed monitoring well (MW1) on 9 March, 2015. The standing water level (SWL) was measured within the 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 final measured field data is presented in Table 8-3 and copies of the completed Field Data Sheets are included in Appendix C.

Table 8-3 Groundwater Field Measurements and Observations

Well ID	SWL (mBTOC)	Purge Volume (L)	DO (mg/L)	Field pH	Field EC (µS/cm)	Temp (°C)	ORP (mV)	Odours / Turbidity
MW1	1.825	5	0.0	7.3	1488	25.1	158#	Slight hydrocarbon odour / Dark brown turbid.

Notes:
GME – Groundwater monitoring event.
SWL – Standing Water Levels as measured from TOC (top of well casing) prior to groundwater sampling.
m BTOC – metres below top of well casing.
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).
ORP – Oxidation/Reduction potential (REDOX).
Field ORP adjusted +204mV for Standard Hydrogen Electrode of Hanna 9828 Water Quality Meter.
All groundwater parameters (pH, EC, ORP and DO) were tested on site.

With reference to Table 8-3, the field pH data indicated that the groundwater was neutral (pH ranged from 6.9 to 7.3) with slightly oxidising conditions present. Electrical Conductivity (EC) measurements were recorded in the range 977 to 1488 µS/cm indicating that the groundwater was of low salinity.

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 Tables T1 to T5 at the back of this report. Completed documentation used to track soil sample movements and laboratory receipt (i.e. COC and SRA forms) are copied in Appendix D and all laboratory analytical reports for tested soil samples are presented in Appendix E.

Table 8-4 Summary of Soil Analytical Results

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Concentrations exceeding adopted SILs
Hydrocarbons				
12	F1	<25	<25	None
12	F2	<25	<25	None
12	F3	<90	1300	BH2 0.2-0.4 ESL
12	F4	<120	590	None
12	Benzene	<0.1	<0.1	None
12	Toluene	<0.1	0.1	None
12	Ethyl benzene	<0.1	<0.1	None
12	Total xylenes	<0.3	<0.3	None
PAHs				
12	Benzo(a)pyrene	<0.1	4	BH2_0.2-0.4, BH2_0.6-0.8, BH5_0.6-0.8, BH5_1.0-1.2, BH6_0.2-0.4, BH6_0.5-0.7 ESL
12	B(α)P TEQ	<0.3	5.8	BH2 0.2-0.4, BH6 0.5-0.7 HIL
12	Total PAHs	<0.8	49	None
12	Naphthalene	<0.1	0.2	None
OCPs				
8	OCPs	Not Detected	Not Detected	None
OPPs				
8	OPPs	Not Detected	Not Detected	None
PCBs				
8	PCBs	Not Detected	Not Detected	None
Heavy Metal				
11	Arsenic	<3	39	None
11	Cadmium	<0.3	1.8	None
11	Chromium (Total)	2	14	None
11	Copper	3	120	BH1_0.2-0.4 EIL
11	Lead	2	230	None
11	Mercury	<0.01	0.51	None
11	Nickel	<0.5	15	None
11	Zinc	6	480	BH1_0.2-0.4, BH2_0.2-0.4, BH5_0.6-0.8, BH6_0.2-0.4, BH6_0.5-0.7 EIL

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Concentrations exceeding adopted SILs
Asbestos				
8	Asbestos	No asbestos detected	No asbestos detected	None

Notes: SIL = Soil Investigation Levels (as detailed in Section 6.3)

Heavy Metals

With reference to Table T1, all heavy metals concentrations were below the corresponding health based SILs for residential settings with minimal soil access.

Exceedances of the derived ecological investigation levels (EIL) was detected for the heavy metal copper in fill sample BH1_0.2-0.4 (120mg/kg) and zinc in fill samples BH1_0.2-0.4 (330mg/kg), BH2_0.2-0.4(480mg/kg), BH5_0.6-0.8 (230mg/kg), BH6_0.2-0.4 (180mg/kg), BH6_0.5-0.7 (140mg/kg).

TRH

As shown in Table T2, all TRH concentrations were below the corresponding adopted SIL for TRH.

The ecological screening level (ESL) for the F3 TRH fraction was exceeded in the fill layer in sample BH2_0.2-0.4 with a concentration of 1300mg/kg.

BTEX and Naphthalene

As shown in Table T2 all BTEX and naphthalene concentrations were below the detection limit and below the adopted criteria for human health and ecology.

PAH

As summarised in Table T3 exceedances of the human health adopted criteria were noted for carcinogenic PAHs in the fill layer of BH2_0.2-0.4 (5.8mg/kg) and BH6_0.5-0.7 (4.1mg/kg). The remaining analysed soil samples for PAHs reported concentrations either below the detection limit or below the adopted criteria for human health.

Exceedances were also noted of the ecological adopted criterion for benzo(α)pyrene in the fill layer at sampling locations BH2_0.2-0.4, BH2_0.6-0.8, BH5_0.6-0.8, BH5_1.0-1.2, BH6_0.2-0.4 and BH6_0.5-0.7 ranging from 0.9mg/kg to 4mg/kg.

Asbestos

As summarised in Table T4, asbestos fibres were not detected in any of the analysed soil samples.

OCP, OPP and PCB

With reference to Table T5, no detectable concentration of any of the screened OCP, OPP and PCB compounds was identified in any of the tested samples. All laboratory PQLs were also within the corresponding SILs.

8.3.2 Groundwater Analytical Results

Laboratory analytical results for groundwater samples are summarised in Tables T6 and T7, which also include the adopted GILs. Completed documentation used to track groundwater sample movements and laboratory receipt (COC and SRA forms) are copied in Appendix D. Copies of the laboratory analytical reports are attached in Appendix E.

Heavy Metals

With reference to Table T6 exceedances of the adopted GILs for heavy metals arsenic (17µg/L), chromium (37 µg/L), nickel (10 µg/L) and zinc (110 µg/L). All remaining concentrations for heavy metals were reported in concentrations below the adopted GILs.

TPHs and BTEX

As shown in Table T6, tested TRH concentrations were either below the detection limit or below the adopted criteria with the conservative exception of TRH F1 fraction reported as <2500 µg/L due to matrix interference. All BTEX concentrations were reported below the detection limit or below the adopted criteria.

PAHs

As shown in Table T6, exceedance of the adopted GIL for benzo(α)pyrene with a concentration of 4 µg/L was reported in MW1. Total PAH concentration of 49 µg/L was also reported to be well above the laboratory preactical quantitation limits (PQL).

SVOCs & VOCs

As shown in Table T7, adjusted laboratory detection limits of <15 µg/L for vinyl chloride were reported above adopted GIL for drinking water (0.3 µg/L). Adjusted laboratory detection limits to <25 µg/L for the other VOC compounds in Table T7 compounds were also reported. It is important to note that while the adjusted PQLs were in excess of the respective GILs, this does not confirm that the contaminant parameters are present at detectable concentrations.

9. SITE CHARACTERISATION DISCUSSION

9.1 CONCEPTUAL SITE MODEL

On the basis of investigation findings the preliminary CSM discussed in Section 4 was considered to appropriately identify contamination sources, migration mechanisms and exposure pathways, as well as potential onsite and offsite receptors. Previously known data gaps, as outlined in Section 4.4 have been largely addressed; however, the following data gaps remain:

- Location of UPSS and extent of any soil or groundwater impacts as indicated on the central eastern boundary adjacent filling points (shown in Figure 2) and north eastern area around former workshop; and
- Groundwater at the site has not been adequately addressed, given only a single monitoring well was installed due to access restriction (i.e. office areas and height restrictions). As such further investigation is warranted to adequately characterise both up-gradient and down-gradient groundwater and flow direction.

Although site soil sampling coverage was partly restricted due to site accessibility (i.e. drilling rig height restrictions, tenanted office areas), the investigation showed consistent shallow fill overlying sandstone bedrock, which can be considered representative of soils at the site, subject to any unexpected finds requiring further investigation, which can be managed during redevelopment of the site.

9.2 POLYCYCLIC AROMATIC HYDROCARBON (PAH) IN SOIL

Carcinogenic PAHs concentrations (calculated as benzo(a)pyrene toxicity equivalent quotient as per NEPM 2013) were reported in excess of the health-based SILs for residential use with minimal soil access, believed to be due to ash within the fill layer at sampling locations BH2 and BH6. Impacted B(α)P TEQ fill material should be visually identified and segregated in accordance with the NSW EPA Waste Classification Guidelines before removal offsite during excavation for the proposed development.

Benzo(a)pyrene impacts in exceedance of the ecological-based criteria were identified at BH2, BH5 and BH6 within the fill layer. Since fill materials will be excavated and removed for offsite disposal to enable construction of a two-level, basement car park, no further ecological assessment would be required.

9.3 PAH AND HEAVY METALS IN GROUNDWATER

Elevated concentrations of heavy metals, TRH and PAH including benzo(a)pyrene were detected in in the single on-site monitoring well MW1, as identified in Section 8.3.2. The identified heavy metals are considered indicative of background (regional groundwater quality) conditions; however, the TRH and PAH contamination in groundwater are thought to represent impacts from former and existing UPSS infrastructure identified at the site. Further investigation will be required to delineate the extent of the groundwater impacts and to inform the remedial action plan for the site. This will require the installation of an additional three groundwater monitoring wells to adequately characterise both up-gradient and down-gradient groundwater and flow direction and quality.

9.4 ASBESTOS RISK

While no soil borehole samples tested positive for asbestos in fill materials beneath the building slab, potential existing building materials (i.e. fibrous cement sheet roofing), identified on the warehouse covering the site, may potentially contain asbestos and therefore may require management for any planned demolition works.

EI also has no knowledge of any Hazardous Materials Survey (HMS) for the site. A HMS should be completed prior to demolition of existing structures. If asbestos is identified, an Asbestos Clearance Certificate is to be prepared by an appropriately licenced contractor to ensure that any hazardous materials are adequately managed before and during demolition to prevent the spreading of contamination and potential health risk to site workers and surrounding areas.

Any demolition works are to be in accordance with Code of Practice for the Safe Removal of Asbestos in Workplaces (Ref. Safe Work Australia, 2011). Following any demolition works, prior to the commencement of any construction activities. A visual inspection of all fill soils across the site should be conducted by a qualified environmental consultant post building demolition, and all wastes designated for offsite disposal to be classified in accordance with the NSW waste classification guidelines.

10. CONCLUSIONS

The land parcel known as 36 Lonsdale Street, Lilyfield was the subject of a Detailed Site Investigation in order to assess the environmental conditions and the potential for on-site contamination associated with the identified current and former land uses. Based on the findings of this assessment and within the limitations of normal environmental investigations (Section 12), EI concluded that:

- The site comprises a 0.96 hectare area occupied by a single level brick warehouse and offices. The property was bound directly to the east by retail, residential areas to the west and south, while to the north is the City West Link roadway and the Metro Light Rail Line.
- A previous Preliminary Site Investigation Report had been completed by EI in February 2015 (Ref. E22390 AA – Rev 1), which indicated that the site has been subject to some commercial/industrial use since at least 1917 and included UST filling points on Lonsdale Street.
- Soil sampling and testing were conducted at seven borehole locations down to a maximum depth of 1.5 mBGL.
- The sub-surface layers comprised fill materials of various constituents to a maximum depth of 1.2 mBGL, including minor ash and hydrocarbon odours. The overall geological configuration within the site was anthropogenic fill underlain by Hawkesbury Sandstone bedrock.
- Groundwater was encountered at approximately 1.8 mBGL during sampling single groundwater monitoring event on 9.3.2015.
- Laboratory testing of selected soil samples from both the fill and undelying natural soils indicated exceedances of the adopted health-based investigation/screening levels in relation to the following analytes:
  - The heavy metals copper and zinc at concentrations exceeding adopted ecological criteria in site fill;
  - B(α)P TEQ exceedances in sampling location BH2 and BH6 within the fill layer;
  - Benzo(a)pyrene in fill at BH2, BH5 and BH6 exceeding ecological criteria; and
  - Total recoverable hydrocarbon (TRH) fraction F3 exceeding the ecological criterion in fill at BH2.
- Testing of groundwater sampled at MW1 identified concentrations in excess of the adopted groundwater investigation criteria:
  - The heavy metals arsenic, chromium, nickel and zinc;
  - TRH fraction F1; and
  - PAH benzo(a)pyrene concentrations.

In summary, soil impacts were identified as being constrained within the fill layer at locations BH2, BH5 and BH6, which may have been present in the fill prior to importation to the site, or may have resulted from past, on site activities.

Groundwater was found to be generally consistent with regional impacts in the Sydney, urban-industrial setting with regards to heavy metals; however, TRH F1, PAH and VOC were also potentially identified. Further investigation and assessment of groundwater after the demolition stage is considered warranted to delineate the extent of impacted groundwater, assess risks to site users and/or the environment and to inform any subsequent remedial action, if required.

In conclusion and within the Statement of Limitations, EI concludes that the site can be made suitable for the proposed development, subject to the recommendations provided. Site contamination issues can be managed through the development application process in accordance with the State Environmental Planning Policy 55 (SEPP 55) – Remediation of Land and the Leichhardt Municipal Council Contaminated Land Policy.

11. RECOMMENDATIONS

It is assumed that during the proposed construction of a basement level car park as part of the development, all fill and residual soil materials will be removed from the site, therefore in view of the above findings and in accordance with the NEPM 2013 guidelines, it is considered that the site will be made suitable for the proposed residential development on completion of the following recommendations:

1. Preparation of a Remedial Action Plan (RAP) to outline remediation requirements for contaminated soils and groundwater. The RAP should include further soil and groundwater investigations to close outstanding data gaps, including:

    a) Remediation and validation of soils surrounding all identified UPSS infrastructure;

    b) Remediation, waste classification of impacted soils from the UPSS areas and other areas of the site;

    c) Installation of three additional groundwater wells with at least one additional round of groundwater sampling and laboratory analysis for the relevant chemicals of concern;

    d) A well elevation survey followed by an assessment of hydraulic gradient, aquifer hydraulic conductivity and groundwater flow direction; and

    e) An assessment of risks to site users and/or the environment, should groundwater contamination be confirmed.

2. Due to the restricted site access caused by the presence of tenants and structures, additional works required as part of the RAP should be conducted once the site has either been vacated or once demolition of structures has been completed.

3. Any material being removed from site (including virgin excavated natural materials or VENM) must be classified for off-site disposal with an accompanying Waste Classification Certificate provided by a suitably qualified and experienced environmental scientist, in accordance the EPA (2014) Waste Classification Guidelines.

4. Any material being imported to the site should be assessed (validated) for potential contamination in accordance with NSW EPA guidelines as being suitable for the intended land use or be certified in accordance with EPA (2014) as VENM or ENM.

5. Any dewatering activity necessary for excavation of basement car parking will require the appropriate approvals from Council and Sydney Water including ongoing groundwater disposal monitoring.

6. Validate that remediated areas are left free of contamination by comparing analytical results for excavation surfaces and any backfill material, against the adopted Remediation Criteria.

7. Preparation of a final site validation report by a qualified environmental consultant, certifying the suitability of the site for the proposed development.

12. STATEMENT OF LIMITATIONS

This report has been prepared for the exclusive use of Ozzy States Pty Ltd , 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 Mr Remolo Negro in the DSI proposal (ref: P12963.1) on 23.02.2015.

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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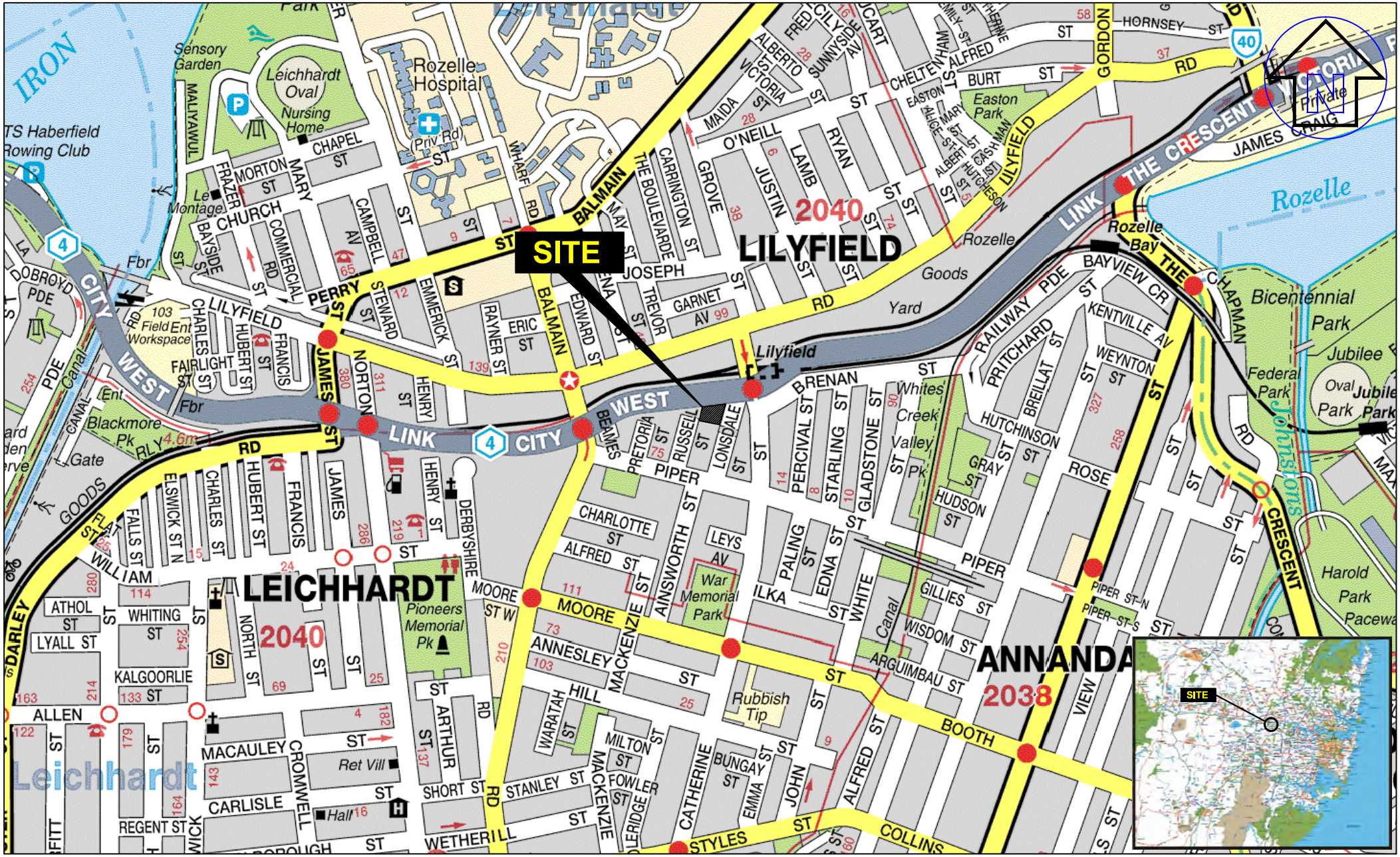
ABBREVIATIONS

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
BH	Borehole
BTEX	Benzene, Toluene, Ethyl benzene, Xylene
COC	Chain of Custody
CSM	Conceptual Site Model
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 C6 – C10 less the sum of BTEX concentrations (Ref. NEPM 2013, Schedule B1)
F2	TRH >C10 – C16 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
m	Metres
m AHD	Metres Australian Height Datum
m BGL	Metres Below Ground Level
mg/m^3	Milligrams per cubic metre
mg/L	Milligrams per litre
µg/L	Micrograms per litre
mV	Millivolts
MW	Monitoring well
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

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
TDS	Total dissolved solids (a measure of water salinity)
TPH	Total Petroleum Hydrocarbons (superseded term equivalent to TRH)
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
USEPA	United States Environmental Protection Agency
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds (specific organic compounds which are volatile)
VOCCs	Volatile Organic Chlorinated Compounds (a sub-set of the VOC analysis suite)

FIGURES



Drawn:	D.R	Ozzy States Pty Ltd Detailed Site Investigation 36 Lonsdale St, Lilyfield NSW Site Location Plan
Approved:	D.S	
Date:	14-07-14	
Approx Scale:	N.T.S	

Figure: 1

Project: E22390 AB

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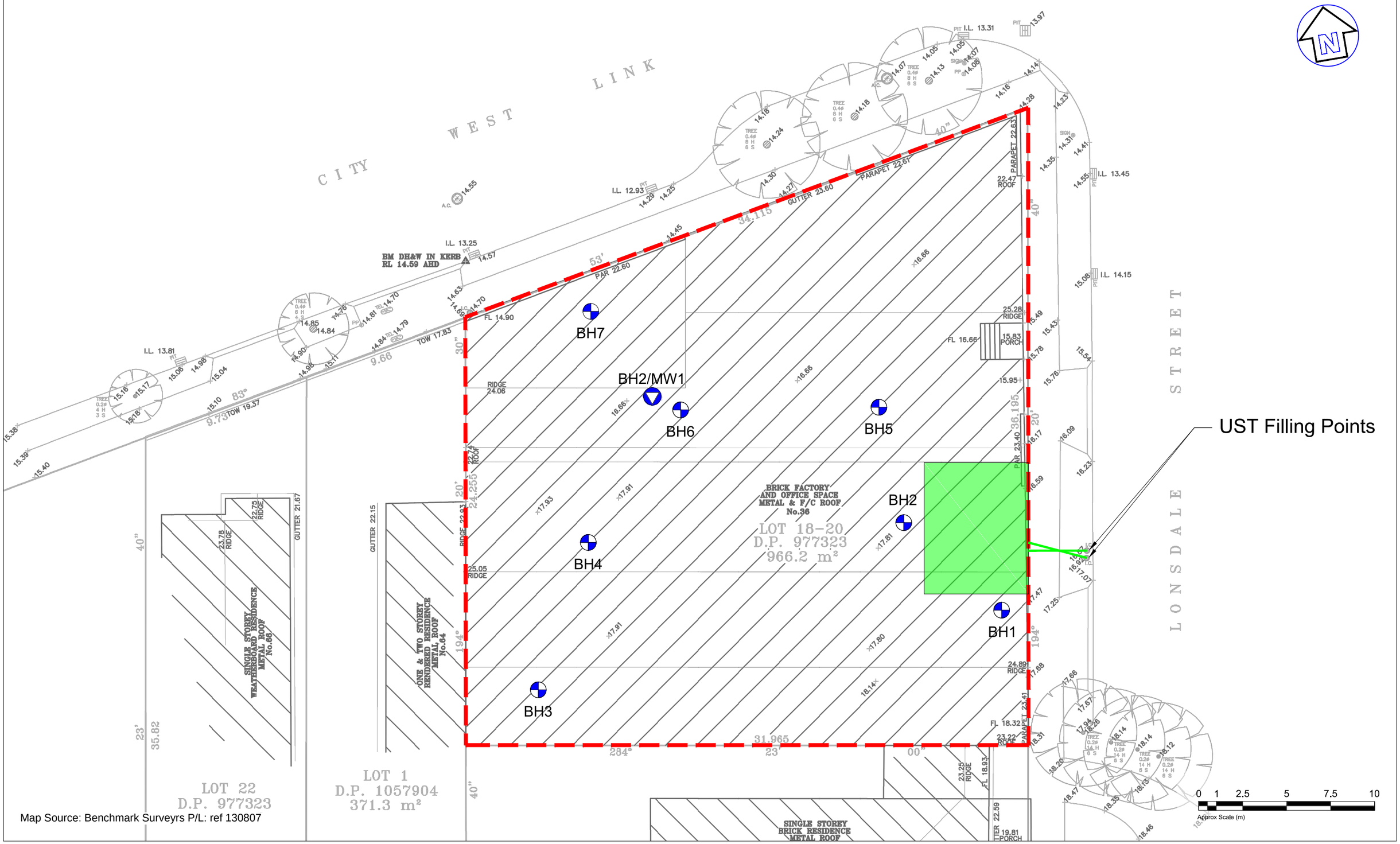

Map Source: Benchmark Surveyrs P/L: ref 130807

LEGEND

- Proposed borehole location
- Proposed borehole / monitoring well location
- Possible UST location
- Approximate location of UST infrastructure (confirmed by GPR)
- Approximate site boundary

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Approx Scale:	1:200@ A3

Ozzy States Corporation Pty Ltd
Detailed Site Investigation
36 Lonsdale Street,
Lilyfield, NSW
Sampling Location Plan

Figure: 2

Project: E22390 AB

KEY

	Sample ID
Date	dd-mm-yy
Analyte	Conc

Soil Notes:
All concentrations are in mg/kg. The table above shows exceedances of HILs and EILs, where applicable, against the HIL B human health criteria. Refer to **Tables T1 to T5** for adopted HILs and EILs.

* = Laboratory PQL has been raised due to interference. Not treated as exceedance.
= Exceedance of HIL B Criteria
= Exceedance of EILs
carc PAH = Carcinogenic PAHs (as Benzo[ǔ]Pyrene Toxicity Equivalence Quotient)

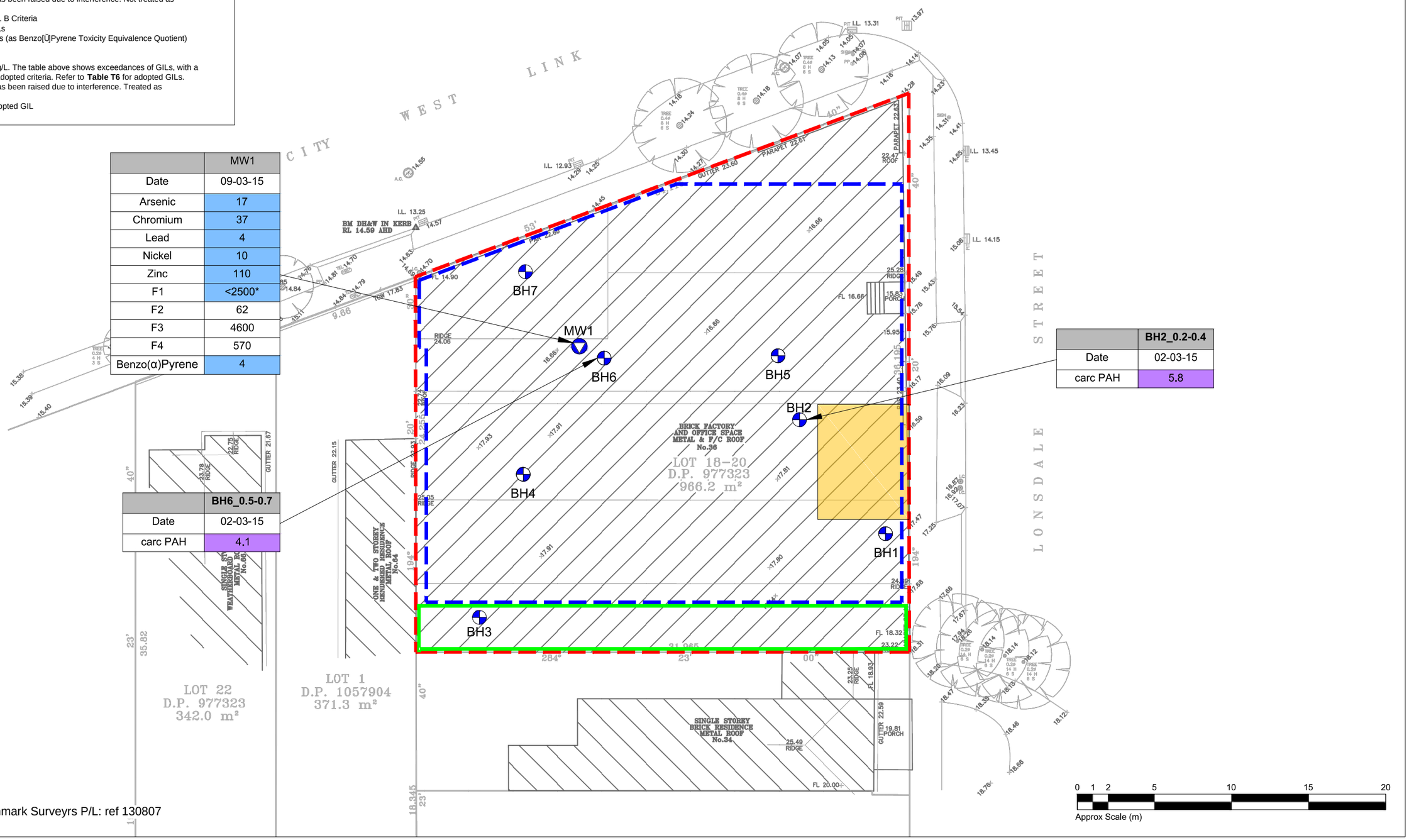
Groundwater Notes:
All concentrations are in ɛg/L. The table above shows exceedances of GILs, with a conservative approach to adopted criteria. Refer to **Table T6** for adopted GILs.

* = Laboratory PQL has been raised due to interference. Treated as exceedance.
= Exceedance of adopted GIL

	MW1
Date	09-03-15
Arsenic	17
Chromium	37
Lead	4
Nickel	10
Zinc	110
F1	<2500*
F2	62
F3	4600
F4	570
Benzo(α)Pyrene	4

	BH2_0.2-0.4
Date	02-03-15
carc PAH	5.8

	BH6_0.5-0.7
Date	02-03-15
carc PAH	4.1



Map Source: Benchmark Surveyrs P/L: ref 130807

LEGEND

- Proposed borehole location
- Proposed borehole / monitoring well location
- Possible UST location
- Approximate basement excavation footprint
- Approximate deep soil landscaping area
- Approximate site boundary

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Ozzy States Corporation Pty Ltd
Detailed Site Investigation
36 Lonsdale Street,
Lilyfield, NSW
Exceedance Plan

Figure: 3

Project: E22390 AB

TABLES

Sample ID	Arsenic[1] (mg/kg)	Cadmium (mg/kg)	Chromium[2] (mg/kg)	Copper (mg/kg)	Lead[3] (mg/kg)	Mercury[4] (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)
BH1_0.2-0.4	6	1.1	8	**120**	230	0.37	15	**330**
BH2_0.2-0.4	6	1.8	8	89	220	0.10	10	**480**
BH2_0.6-0.8	<3	<0.3	5	5	14	0.01	1	49
BH3_0.2-0.4	<3	<0.3	7	68	17	0.04	7	33
BH4_0.2-0.4	<3	<0.3	14	85	2	<0.01	7	8
BH5_0.2-0.4	39	<0.3	9	37	32	0.16	1	29
BH5_0.6-0.8	29	0.4	14	79	34	0.16	10	**230**
BH5_1.3-1.5	<3	<0.3	5	3	4	0.01	<0.5	**6**
BH6_0.2-0.4	8	0.4	10	33	100	0.24	4	**180**
BH6_0.5-0.7	9	0.5	8	30	110	0.51	4	**140**
BH7_0.15-0.3	<3	<0.3	2	28	2	<0.01	3	6
SIL								
HIL B	500	150	500	30000	1200	120	1200	60000
EIL[5]	100[6]	NR	190	95	1100	NR	30	70

Notes:

	Highlighted concentration value indicates exceedance of EIL.
SIL	Soil investigation level.
HIL	Health-based investigation levels (mg/kg) as per NEPM 1999 Schedule B1 2013 Amendment.
HIL B	Residential with minimal oppurtunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
EIL	Ecological Investigation Levels (mg/kg) as per NEPM. As the physiochemical properties of soil onsite was not tested, the most conservative Added Contaminant Limits values provided in NEPM were adopted.
NR	No recommended soil assessment criteria are currently available for the indicated parameter(s).
NA	Sample 'not analysed'
1	Arsenic - HIL assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate (refer to NEPM 1999 Schedule B7 2013 Amendment).
2	HILs are for Chromium VI while EILs for Chromium III. Concentrations reported were total Chromium including both VI and III. Speciation were not conducted as total Chromium concentrations reported were well under SILs.
3	Lead - HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.
4	Value shown is representative of inorganic mercury as provided in Table 1A(1) (refer to NEPM 1999 Schedule B1 2013 Amendment).
5	In the absence of site specific soil data, added contaminant limits as described within the NEPM 2013 have been applied, and are considered to be conservative.
6	Aged values are applicable to arsenic contamination present in soil for at least two years. For fresh contamination refer to NEPM 1999 Schedule B5c 2013 Amendment.

Sample ID	Depth (m BGL)	Primary Soil Texture	Total Petroleum Hydrocarbons (mg/kg)					Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Total Xylenes (mg/kg)	Naphthalene (mg/kg)
			F1[1]	F2[2]	F2 minus Naphthalene	F3[3]	F4[4]					
BH1_0.2-0.4	0.2-0.4	FILL: Gravelly SAND (mild hydrocarbon odour & trace ash)	<25	<25	<25	220	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH2_0.2-0.4	0.2-0.4	FILL: Gravelly SAND (mild hydrocarbon odour & trace ash)	<25	<25	<25	**1300**	590	<0.1	<0.1	<0.1	<0.3	0.2
BH2_0.6-0.8	0.6-0.8	SANDSTONE	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH3_0.2-0.4	0.2-0.4	SAND	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH4_0.2-0.4	0.2-0.4	SAND	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH5_0.2-0.4	0.2-0.4	Clayey SAND	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH5_0.6-0.8	0.6-0.8	Clayey SAND	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH5_1.0-1.2	1.0-1.2	Clayey SAND (mild hydrocarbon odour & staining)	<25	<25	<25	130	<120	<0.1	0.1	<0.1	<0.3	<0.1
BH5_1.3-1.5	1.3-1.5	SANDSTONE	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH6_0.2-0.4	0.2-0.4	FILL: Gravelly SAND (trace ash)	<25	<25	<25	160	<120	<0.1	<0.1	<0.1	<0.3	<0.1
BH6_0.5-0.7	0.5-0.7	FILL: Gravelly SAND (trace ash)	<25	<25	<25	210	<120	<0.1	0.1	<0.1	<0.3	<0.1
BH7_0.15-0.3	0.15-0.3	FILL: SAND	<25	<25	<25	<90	<120	<0.1	<0.1	<0.1	<0.3	<0.1
SIL												
HSL A & B (SAND)	0 m to <1 m	Sand	45	NR	110	NR	NR	0.5	160	55	40	3
HSL A & B (CLAY)	0 m to <1 m	Clay	50	NR	280	NR	NR	0.7	480	NL	110	5
ESL[5]		Coarse grained	180*	120*	NR	300	2800	50	85	70	105	170
		Fine grained				1300	5600	65	105	125	45	
Management Limits[6]		Coarse grained	700	1000	NR	2500	10000	NL	NL	NL	NL	NR
		Fine grained	800			3500		NL	NL	NL	NL	

Notes:

	Highlighted concentration value indicates exceedance of ESL.
SIL	Soil investigation level.
HSL	Health screening level as per NEPM 1999 Schedule B1 2013 Amendment. Different HSLs apply based on the primary soil texture encountered.
HSL A & B	Low to high density residential settings.
ESL	Ecological screening levels (mg/kg). ESL adopted is for urban residential and public open space development.
Management limits	As per Table 1 B(7) in NEPM 1999 Schedule B1 2013 Amendment.
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, i.e. where the soil vapour is at equilibrium with the pore water, then the soil vapour source cannot exceed a level that would result in the maximum allowable vapour risk for the given scenario, therefore the limit is not limiting.
NR	No recommended soil assessment criteria are currently available for the indicated parameter(s).
NA	Sample 'not analysed'
<PQL	Concentrations of analytes were below laboratory Practical Quantification Limit.
1	To obtain F1 subtract the sum of BTEX concentrations from the C6-C10 fraction.
2	F2 refers to Total Recoverable Hydrocarbon >C10-C16 fraction.
3	F3 refers to Total Recoverable Hydrocarbon >C16-C34.
4	F4 refers to Total Recoverable Hydrocarbon >C34-C40.
5	ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability.
6	Management limits are applied after consideration of relevant ESLs and HSLs. BTEX and Naphtalene are not subtracted from the relevant fractions to obtain F1 and F2 when considering management limits.

Sample ID	Polyaromatic Hydrocarbons (mg/kg)		
	Carcinogenic PAHs (as Benzo[a]pyrene TEQ)	Benzo(a)pyrene	Total PAHs
BH1_0.2-0.4	0.8	0.5	4
BH2_0.2-0.4	**5.8**	**4**	49
BH2_0.6-0.8	1.8	**1.3**	15
BH3_0.2-0.4	<0.3	<0.1	<0.8
BH4_0.2-0.4	<0.3	<0.1	<0.8
BH5_0.2-0.4	0.9	0.6	5
BH5_0.6-0.8	1.8	**1.3**	12
BH5_1.0-1.2	1.5	**1**	11
BH5_1.3-1.5	<0.3	<0.1	<0.8
BH6_0.2-0.4	1.3	**0.9**	9
BH6_0.5-0.7	**4.1**	**3**	28
BH7_0.15-0.3	<0.3	<0.1	<0.8
SIL			
HIL B	4	NR	400
ESL	NR	0.7	NR

Notes:

	Concentration value indicates exceedance of adopted HIL.
	Concentration exceeds adopted ESL.
SIL	Soil investigation level.
HIL	Health-based investigation level (mg/kg).
HIL B	Residential with minimal oppurtunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
ESL	Ecological screening levels (mg/kg) as per NEPM 1999 Schedule B1 2013 Amendment.
NR	No recommended soil assessment criteria are currently available for the indicated parameter(s).

Sample ID	Asbestos (% w/w)
BH1_0.2-0.4	<0.01
BH2_0.2-0.4	<0.01
BH3_0.2-0.4	<0.01
BH4_0.2-0.4	<0.01
BH5_0.2-0.4	<0.01
BH6_0.2-0.4	<0.01
BH6_0.5-0.7	<0.01
BH7_0.15-0.3	<0.01
SIL	
HSL B	0.04%

Notes:

SIL	Soil investigation level.
HSL	Health screening level as per NEPM 1999 Schedule B1 2013 Amendment.
HSL B	Residential with minimal oppurtunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.

Sample ID	OCP								Total OPPs (mg/kg)	Total PCBs (mg/kg)
	Aldrin (mg/kg)	Dieldrin (mg/kg)	Endrin (mg/kg)	Chlordane (mg/kg)	Heptachlor (mg/kg)	DDT (mg/kg)	DDD (mg/kg)	DDE (mg/kg)		
BH1_0.2-0.4	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH2_0.2-0.4	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH3_0.2-0.4	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH4_0.2-0.4	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH5_0.2-0.4	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH6_0.2-0.4	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH6_0.5-0.7	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
BH7_0.15-0.3	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	ND	<1
SIL										
HIL B	Total 10		20	90	10	Total 600			NR	1
EIL	NR	NR	NR	NR	NR	180	NR	NR	NR	NR

Notes:

SIL	Soil investigation level.
HIL	Health-based investigation level (mg/kg) as per NEPM 1999 Schedule B1 2013 Amendment.
HIL B	Residential with minimal oppurtunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments.
EIL	Ecological Investigation Level (mg/kg) as per NEPM as per NEPM 1999 Schedule B1 2013 Amendment.
NR	No recommended soil assessment criteria are currently available for the indicated parameter(s).
ND	Concentrations of all tested analytes in this group was under the laboratory practical quantifation limit.
NA	Sample not tested for analyte.

Sample ID	Heavy Metals								BTEX				TRH				PAH		
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Total Xylene	F1*	F2**	F3 ($>C_{16}$-C_{34})	F4 ($>C_{34}$-C_{40})	Benzo (a) pyrene	Naphthalene	Total PAH
MW1	17	0.1	37	1	4	<0.1	10	110	<25	<25	<25	<75	<2500	62	4600	570	4	0.3	49
GIL																			
GIL (Marine Waters)	NR	0.7[3]	27 (Cr III) / 4.4 (Cr VI)	1.3	4.4	0.1[3]	7	15[1]	500[1]	NR	NR	NR	NR	NR	NR	NR	NR	16	NR
GIL (Fresh Waters)	24 (As III) / 13 (As V)	0.2	- (Cr III) / 1 (Cr VI)[1]	1.4	3.4	0.06[3]	11	8[1]	950	NR	NR	350 (o-xylene) / 200 (p-xylene)	NR	NR	NR	NR	NR	50[1]	NR
HSL A & B [2]	NR	NR	NR	NR	NR	NR	NR	NR	800	NL	NL	NL	1000	1000	NR	NR	NR	NL	NR
ADW	10	2	50 (as CrVI)	2000	10	1	20	NR	1	800	300	600	NR	NR	NR	NR	0.01	NR	NR

Notes:

All results are in units of µg/L.

	Concentration value indicates exceedance of adopted GILs.
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 Marin Waters and Fresh Waters for typical slightly-moderately disturbed systems for water table being 2 m - <4 m below the final slab level.
ADW	NEPM (2013) Groundwater Investigation Levels for drinking water quality, based on Australian Drinking Water Guidelines (NHMRC 2011).
HSL	Health-based Screening Level.
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, i.e. where the soil vapour is at equilibrium with the pore water, then the soil vapour source cannot exceed a level that would result in the maximum allowable vapour risk for the given scenario, therefore the limit is not limiting.
NR	No recommended groundwater assessment criteria are currently available for the indicated parameter(s).
ND	Concentrations of all tested analytes in this group was under laboratory's practical quantifation limit.
*	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	NEPC (2013) Table 1A(4) Groundwater HSL A & HSL B for vapour intrusion at the contaminant source depth ranges in sand, which is consistent with the groundwater sampling depth and soil textures encountered.
3	Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZECC & ARMCANZ (2000) for further guidance.

Sample ID	VOCs														
	Trichloroethene (Trichloroethylene,TCE)	Tetrachloroethene (Perchloroethylene,PCE)	Vinyl chloride (Chloroethene)	trans-1,2-dichloroethene	1,1-dichloroethene	cis-1,2-dichloroethene	Chloroform (THM)	1,2-dichloroethane	1,1,1-trichloroethane	Bromodichloromethane (THM)	1,1,2-trichloroethane	Bromoform (THM)	1,3,5-trimethylbenzene	1,2,4-trimethylbenzene	Naphthalene
MW1	<25	<25	<15	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
GIL															
GIL (Marine Water)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1900	NR	NR	NR	50
HSL A & B [1]	NR	NR	NR	NR	NR	NR	NR	NR	800	NR	NR	NR	NR	1000	1000
ADW	NR	50	0.3	NR	30	60	3	0.3	NR	NR	NR	NR	NR	NR	NR
OSWER [2]	5	11	2.5	180	190	210	80	23	3100	21	41	0.08	25	24	150

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 Marine Waters for typical slightly-moderately disturbed systems.

ADW NEPM (2013) Groundwater Investigation Levels for drinking water quality, based on Australian Drinking Water Guidelines (NHMRC 2011).

NR No groundwater assessment criteria are currently available for the indicated parameter(s).

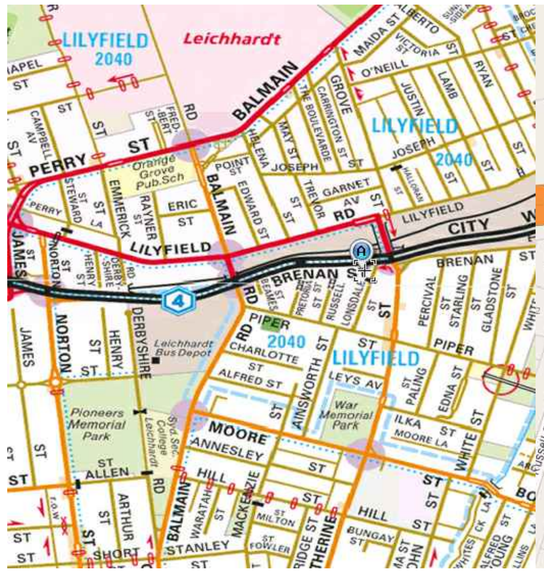
NA Not analysed.

1 NEPC (2013) Table 1A(4) Groundwater HSL A & HSL B for vapour intrusion at the contaminant source depth ranges in sands 2m to <4m.

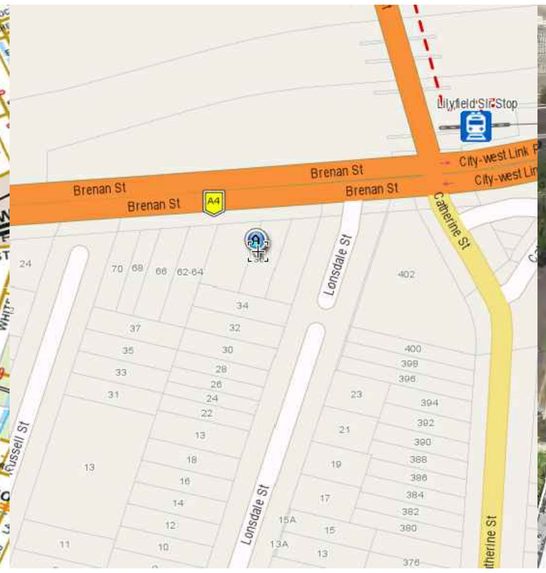
2 Target groundwater concentration correponding to indoor air concentrations associated with lifetime cancer risk, assuming the Soil Gas to Indoor Air Attenuation Factor = 0.001 and partitioning across the water table obeys Henry's Law. Vaues were adopted from Table 2b, "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils", 2002. **Used as interim working criteria only.**

APPENDIX A
Proposed Development Plans & Survey Plans

MIXED USE DEVELOPMENT
36 LONSDALE ST, LILYFIELD



STREET DIRECTORY (www.street-directory.com.au)



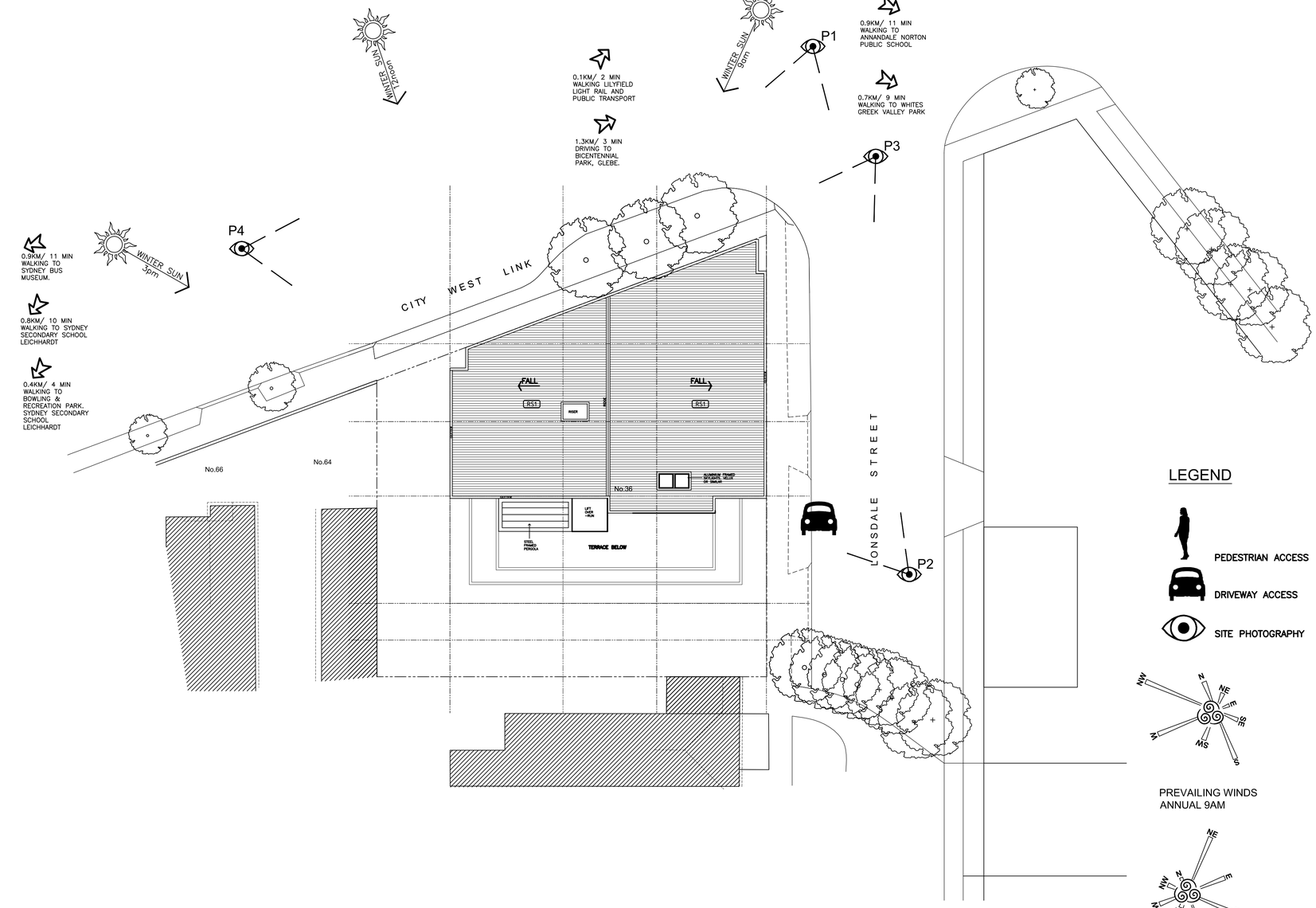
STREET DIRECTORY (www.street-directory.com.au)

AERIAL PHOTOGRAPH (maps.six.nsw.gov.au)

AERIAL PHOTOGRAPH – 1943 (maps.six.nsw.gov.au)

ARCHITECTURAL DRAWINGS

PROJECT#	DWG#	TITLE	SCALE	ISSUE	DATE
D1430					
	DA - 00	COVER SHEET	NTS @ A1	C	JAN 2015
	DA - 01	SITE ANALYSIS / ROOF PLAN	1:200 @ A1	C	JAN 2015
	DA - 02	BASEMENT LEVEL 1	1:100 @ A1	C	JAN 2015
	DA - 03	BASEMENT LEVEL 2	1:100 @ A1	C	JAN 2015
	DA - 04	GROUND FLOOR PLAN	1:100 @ A1	C	JAN 2015
	DA - 05	FIRST FLOOR PLAN	1:100 @ A1	C	JAN 2015
	DA - 06	SECOND FLOOR PLAN	1:100 @ A1	C	JAN 2015
	DA - 07	THIRD FLOOR PLAN	1:100 @ A1	C	JAN 2015
	DA - 08	ROOF TERRACE PLAN	1:100 @ A1	C	JAN 2015
	DA - 09	NORTH & EAST ELEVATIONS	1:100 @ A1	C	JAN 2015
	DA - 10	SOUTH & WEST ELEVATIONS	1:100 @ A1	C	JAN 2015
	DA - 11	SECTIONS	1:100 @ A1	C	JAN 2015
	DA - 12	SITE MANAGMENT PLAN	1:100 @ A1	C	JAN 2015
	DA - 13	EXTERNAL FINISHES	NTS @ A1	C	JAN 2015
	DA - 14	ARTIST IMPRESSION	NTS @ A1	C	JAN 2015
	DA - 15	DIAGRAMS - SHADOWS	1:200 @ A1	C	JAN 2015
	DA - 16	DIAGRAMS - SHADOWS	1:200 @ A1	C	JAN 2015
	DA - 17	DIAGRAMS - SHADOWS	1:200 @ A1	C	JAN 2015
	DA - 18	DIAGRAMS - SHADOWS	1:200 @ A1	C	JAN 2015
	DA - 19	DIAGRAMS - SOLAR ACCESS	1:200 @ A1	C	JAN 2015
	DA - 20	DIAGRAMS - GFA	1:200 @ A1	C	JAN 2015
	DA - 21	DIAGRAMS - NATURAL VENTILATION	1:200 @ A1	C	JAN 2015
	DA - 22	DIAGRAMS - POS / LANDSCAPE / COS	NTS @ A1	C	JAN 2015
	DA - 23	DETAILS - DRIVEWAY RAMP	1:100 @ A1	C	JAN 2015
	DA - 24	DETAILS - DRIVEWAY RAMP	1:100 @ A1	C	JAN 2015
	DA - 25	WINDOW / DOOR SCHEDULE	1:100 @ A1	C	JAN 2015
	DA - 26	ROOF PLAN	1:100 @ A1	C	JAN 2015



SITE ANALYSIS

LEGEND

PEDESTRIAN ACCESS

DRIVEWAY ACCESS

SITE PHOTOGRAPHY

Acid Sulfate Soils
- 1 Class 1
- 2 Class 2
- 3 Class 3
- 5 Class 5

Base data 14/10/2013 © Land and Property Information (LPI)

Maximum Floor Space Ratio (n:1)
- D 0.5
- F 0.6
- H 0.7
- N 1.0
- T 2.15
- AREA 1 Refer to clause 4.4 A

Cadastre
Base data 19/08/2014 © Land and Property Information (LPI)

Heritage
- Conservation Area - General
- Item - General
- Item - Archaeological
- Item - Landscape

Cadastre
Base data 02/12/2013 © Land and Property Information (LPI)

Land application - excluded
- SREP Sydney Regional Environmental Plan No. 26 – City West
- CP Callan Park

Zone
- B1 Neighbourhood Centre
- B2 Local Centre
- B4 Mixed Use
- B7 Business Park
- IN2 Light Industrial
- R1 General Residential
- R3 Medium Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP1 Special Activities
- SP2 Infrastructure
- DM Deferred Matter
- SREP Sydney Regional Environmental Plan No. 26 – City West
- CP Callan Park

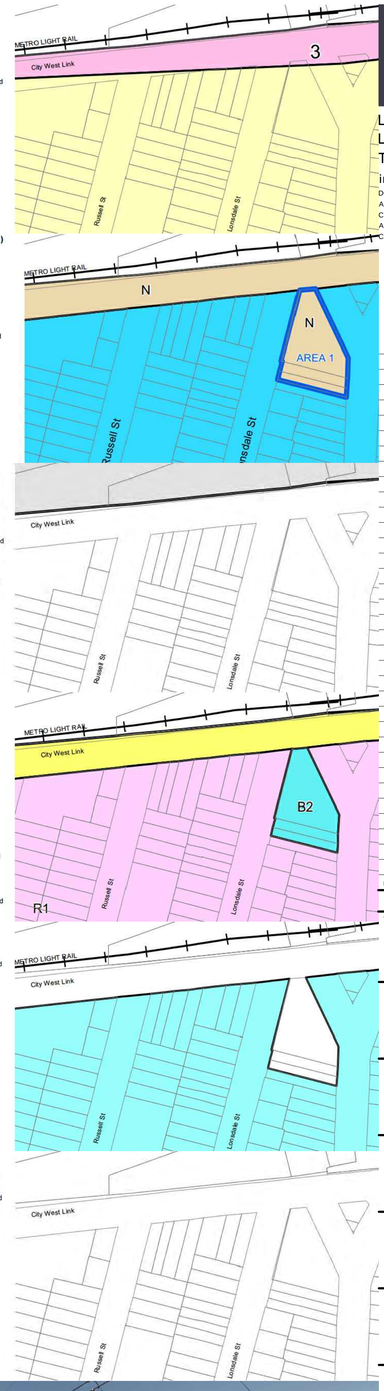
Cadastre
Base data 12/08/2014 © Land and Property Information (LPI)

Minimum Lot Size (sq m)
- B 200

Cadastre
Base data 12/08/2014 © Land and Property Information (LPI)

Additional Permitted Uses
- Refer to schedule 1

Cadastre
Base data 02/12/2013 © Land and Property Information (LPI)



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- PRE-DA
- DA
- CC
- TENDER
- CONSTRUCTION
- AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
C	JAN 2015	COORDINATION	DR
B	JAN 2015	COORDINATION	DR
A	DEC 2014	ISSUE TO CLIENT	DR

CLIENT
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C/O APP CORPORATION Pty LIMITED

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
SITE ANALYSIS &
ROOF PLAN

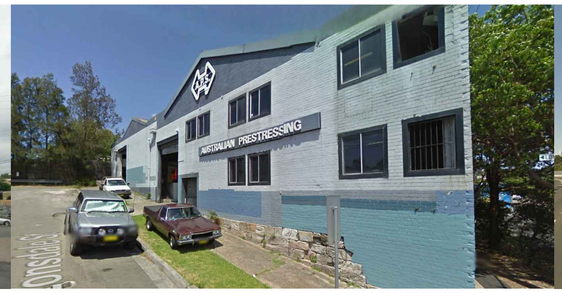
DATE	JAN 2015
SCALE	1:200 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 01

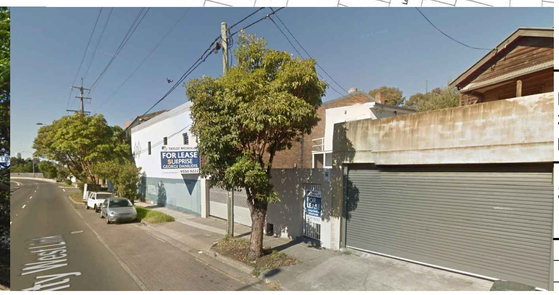
PRELIMINARY

1. LOOKING TOWARDS THE SITE FROM THE INTERSECTION OF LONSDALE STREET & CITY WEST LINK.

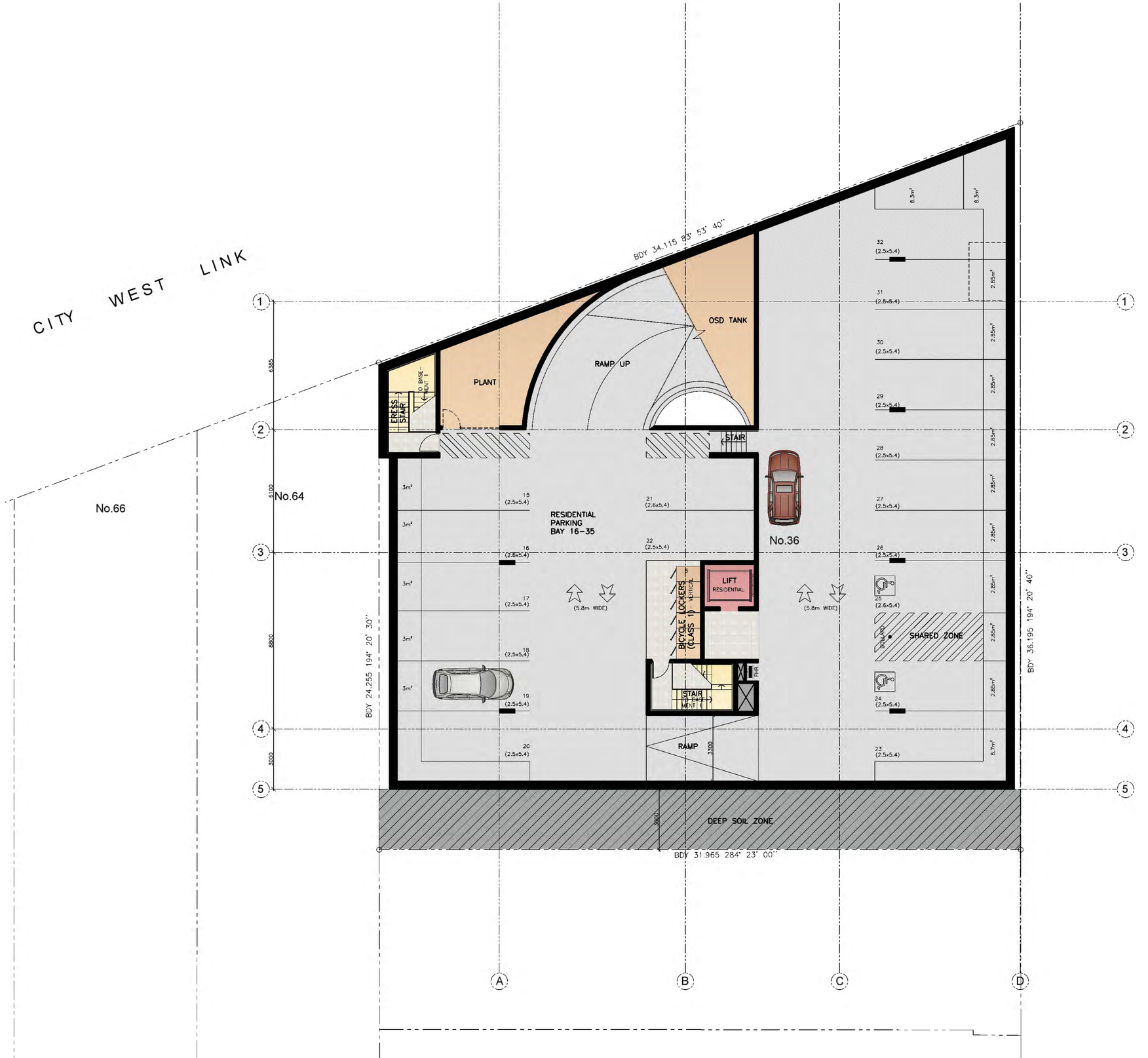
4. LOOKING TOWARDS THE SITE FROM LONSDALE LANE.



3. LOOKING TOWARDS THE SITE FROM LONSDALE STREET.



5. LOOKING TOWARDS THE SITE FROM CITY WEST LINK.



BASEMENT LEVEL 2

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- ( ) PRE-DA
- ( ) DA
- ( ) CC
- ( ) TENDER
- ( ) CONSTRUCTION
- ( ) AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
C	JAN 2015	COORDINATION	DR
B	JAN 2015	COORDINATION	DR
A	DEC 2014	ISSUE TO CLIENT	DR

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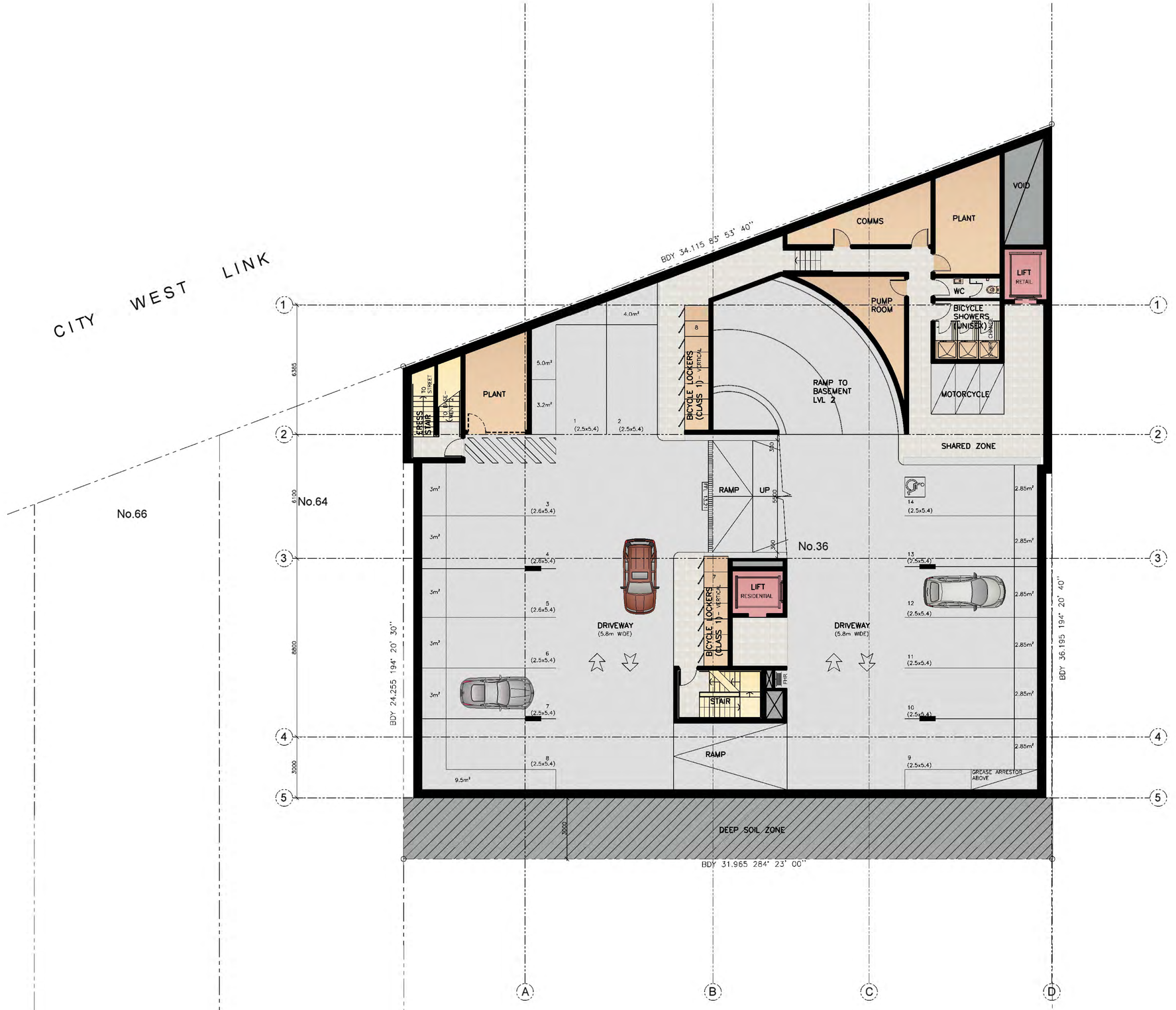
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
BASEMENT LEVEL 2

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 02

PRELIMINARY



BASEMENT LEVEL 1

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- ( ) DA
- ( ) CC
- ( ) TENDER
- ( ) CONSTRUCTION
- ( ) AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
C	JAN 2015	COORDINATION	DR
B	JAN 2015	COORDINATION	DR
A	DEC 2014	ISSUE TO CLIENT	DR

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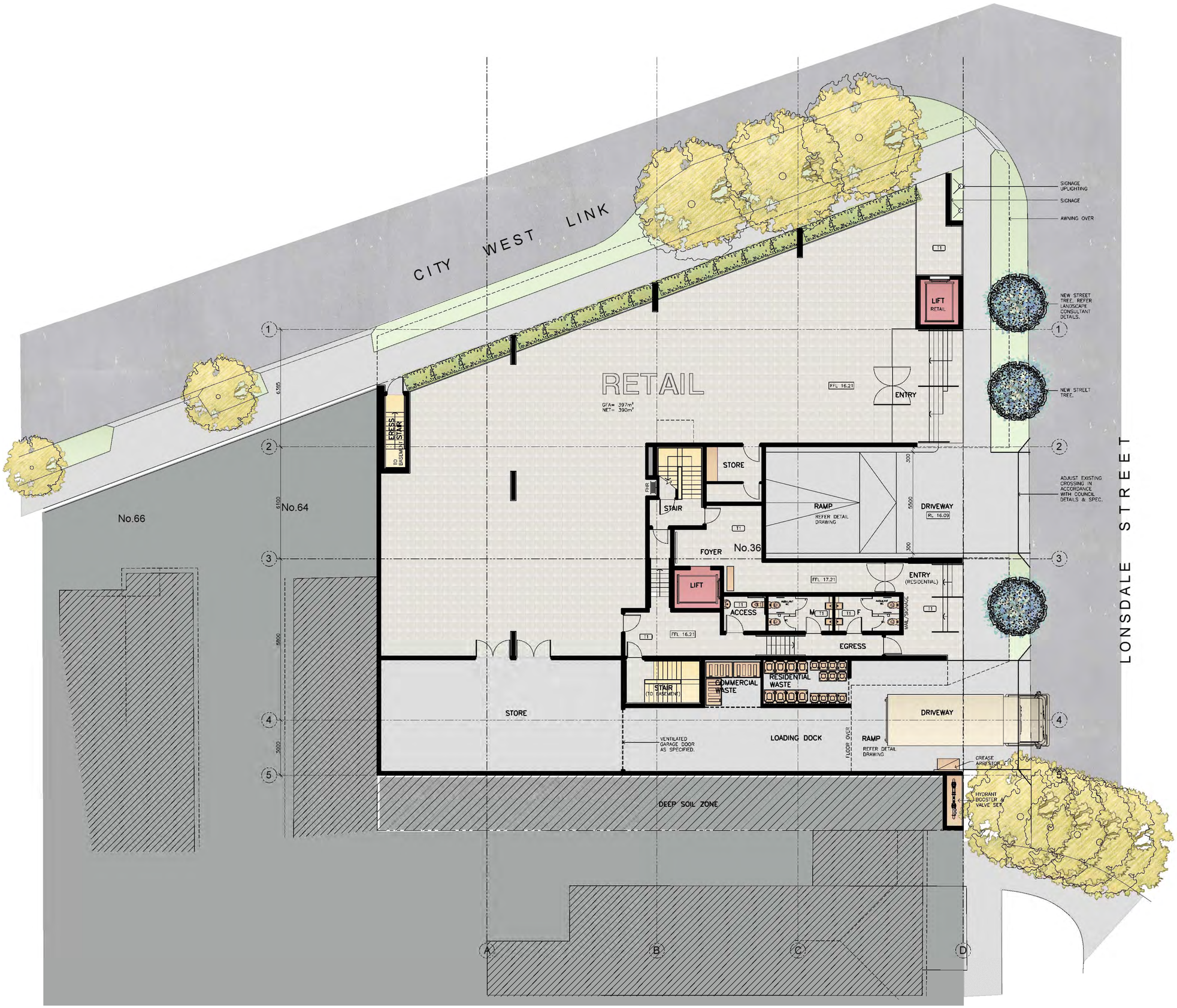
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
BASEMENT LEVEL 1

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No.
03

PRELIMINARY



GROUND FLOOR

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- (●) CIRCULATION
- ( ) PRE-DA
- ( ) DA
- ( ) CC
- ( ) TENDER
- ( ) CONSTRUCTION
- ( ) AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
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A	DEC 2014	ISSUE TO CLIENT	DR

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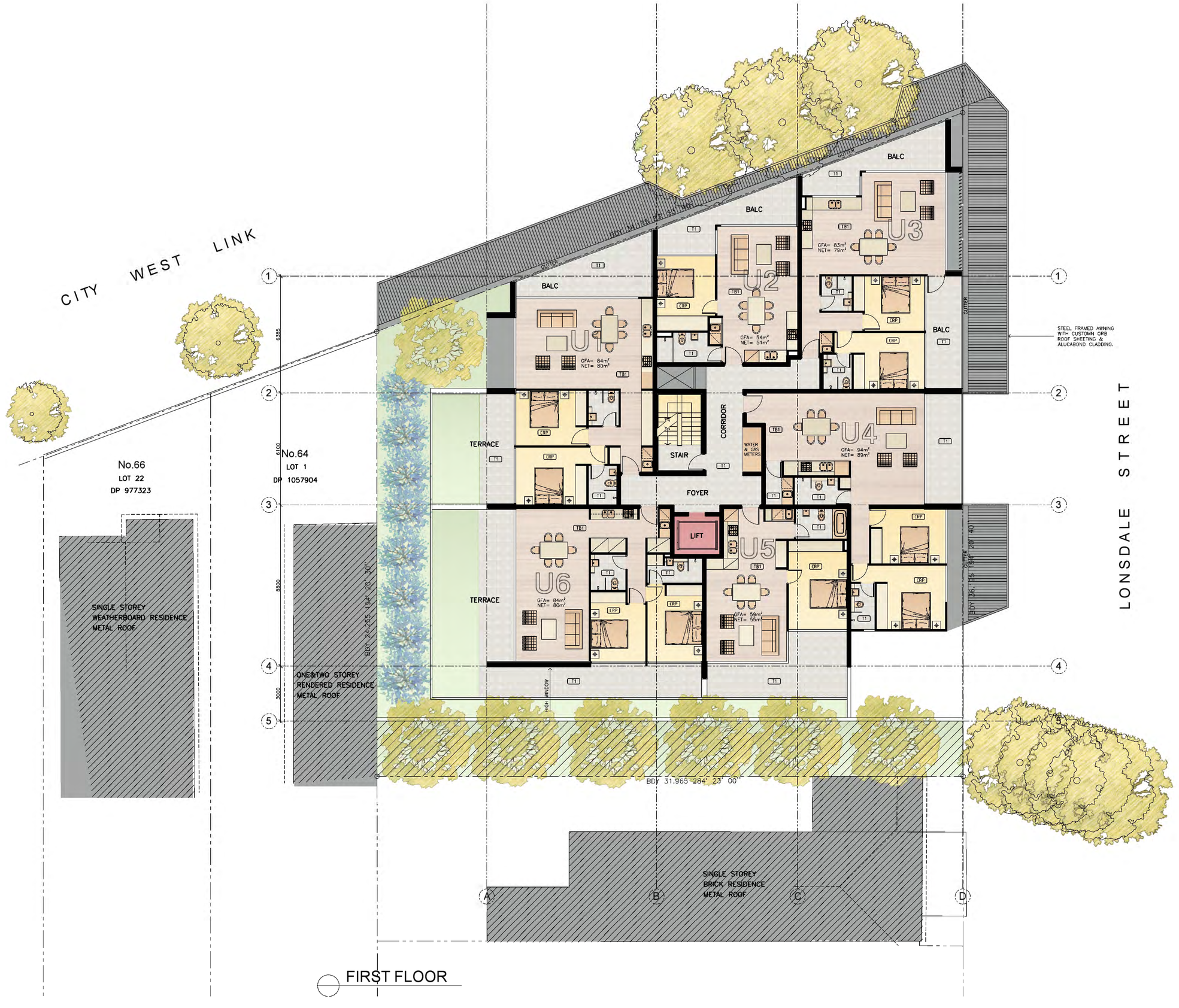
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
GROUND FLOOR PLAN

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 04

PRELIMINARY



FIRST FLOOR

LEGEND

RS1	COLOSBOND 'SURFMIST' ROOF SHEETING.
CL1	WALL CLADING ALUCOBOND PANELS 'PURE WHITE'
BR1	WALL CLADING AUSTRAL BRICK 'OLD COLONIAL'
CL2	WALL CLADING ALUCOBOND 'ANTHRACITE GREY'
W1	WINDOWS & DOOR FRAMING COLORBOND 'MONUMENT'
SC1	METAL FRAMED SCREENS COLORBOND 'MONUMENT'
SC2	METAL PANELS COLORBOND 'MONUMENT'
LVR	METAL LOUVRES COLORBOND 'MONUMENT'
T1	EXTERNAL FLOOR TILES
BL1	BALUSTRADE, GLASS & STAINLESS STEEL
CPB	CARPET.
TB1	TIMBER FLOORING.
UT1	SOLAR HOT WATER SYSTEM.

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
FIRST FLOOR PLAN

DATE	JAN 2015	DRAWING No.	05
SCALE	1:100 @ A1		
JOB No.	D1430		
DRAWN BY	DR		

PRELIMINARY

SECOND FLOOR

LEGEND

RS1	COLOBOND "SURFMIST" ROOF SHEETING.
CL1	WALL CLADING ALUCOBOND PANELS "PURE WHITE"
BR1	WALL CLADING AUSTRAL BRICK "OLD COLONIAL"
CL2	WALL CLADING ALUCOBOND "ANTHRACITE GREY"
WT	WINDOWS & DOOR FRAMING COLORBOND "MONUMENT"
SC1	METAL FRAMED SCREENS COLORBOND "MONUMENT"
SC2	METAL PANELS COLORBOND "MONUMENT"
LVR	METAL LOUVRES COLORBOND "MONUMENT"
T1	EXTERNAL FLOOR TILES
BL1	BALUSTRADE, GLASS & STAINLESS STEEL
CPB	CARPET.
TBT	TIMBER FLOORING.
UT1	SOLAR HOT WATER SYSTEM.

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A1 ORIGINAL SIZE

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
SECOND FLOOR PLAN

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 06

PRELIMINARY

THIRD FLOOR

LEGEND

RS1	COLOBOND "SURFMIST" ROOF SHEETING.
CL1	WALL CLADING ALUCOBOND PANELS "PURE WHITE"
BR1	WALL CLADING AUSTRAL BRICK "OLD COLONIAL"
CL2	WALL CLADING ALUCOBOND "ANTHRACITE GREY"
WI	WINDOWS & DOOR FRAMING COLORBOND "MONUMENT"
SC1	METAL FRAMED SCREENS COLORBOND "MONUMENT"
SC2	METAL PANELS COLORBOND "MONUMENT"
LVR	METAL LOUVRES COLORBOND "MONUMENT"
T1	EXTERNAL FLOOR TILES
BL1	BALUSTRADE, GLASS & STAINLESS STEEL
CPB	CARPET.
TB1	TIMBER FLOORING.
UT1	SOLAR HOT WATER SYSTEM.

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
THIRD FLOOR PLAN

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 07

PRELIMINARY

ROOF TERRACE

LEGEND

RST	COLORBOND 'SURFMIST' ROOF SHEETING.
CL1	WALL CLADING ALUCOBOND PANELS 'PURE WHITE'
BR1	WALL CLADING AUSTRAL BRICK 'OLD COLONIAL'
CL2	WALL CLADING ALUCOBOND 'ANTHRACITE GREY'
W1	WINDOWS & DOOR FRAMING COLORBOND 'MONUMENT'
SC1	METAL FRAMED SCREENS COLORBOND 'MONUMENT'
SC2	METAL PANELS COLORBOND 'MONUMENT'
LVR	METAL LOUVRES COLORBOND 'MONUMENT'
T1	EXTERNAL FLOOR TILES
BL1	BALUSTRADE, GLASS & STAINLESS STEEL
CP8	CARPET.
TB1	TIMBER FLOORING.
UT1	SOLAR HOT WATER SYSTEM.

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
TERRACE LEVEL PLAN

DATE	JAN 2015	DRAWING No.	08
SCALE	1:100 @ A1		
JOB No.	D1430		
DRAWN BY	DR		

PRELIMINARY

NORTH ELEVATION

EAST ELEVATION

LEGEND

RS1	COLOBOND "SURFMIST" ROOF SHEETING.	W1	WINDOWS & DOOR FRAMING COLORBOND "MONUMENT"	T1	EXTERNAL FLOOR TILES
CL1	WALL CLADING ALUCOBOND PANELS "PURE WHITE"	SC1	METAL FRAMED SCREENS COLORBOND "MONUMENT"	BL1	BALUSTRADE, GLASS & STAINLESS STEEL CAPPEL
BR1	WALL CLADING AUSTRAL BRICK "OLD COLONIAL"	SC2	METAL PANELS COLORBOND "MONUMENT"	CPB	
CL2	WALL CLADING ALUCOBOND "ANTHRACITE GREY"	LVR	METAL LOUVRES COLORBOND "MONUMENT"	TB1	TIMBER FLOORING.
				UT1	SOLAR HOT WATER SYSTEM.

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A1 ORIGINAL SIZE

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
NORTH & EAST ELEVATIONS

DATE	JAN 2015	DRAWING No.	09
SCALE	1:100 @ A1		
JOB No.	D1430		
DRAWN BY	DR		

PRELIMINARY

SOUTH ELEVATION

WEST ELEVATION

LEGEND

RST	COLOBOND 'SURFMIST' ROOF SHEETING.	W1	WINDOWS & DOOR FRAMING COLORBOND 'MONUMENT'	T1	EXTERNAL FLOOR TILES
CL1	WALL CLADING ALUCOBOND PANELS 'PURE WHITE'	SC1	METAL FRAMED SCREENS COLORBOND 'MONUMENT'	BLT	BALUSTRADE, GLASS & STAINLESS STEEL CARPET.
BR1	WALL CLADING AUSTRAL BRICK 'OLD COLONIAL'	SF2	METAL PANELS COLORBOND 'MONUMENT'	TB1	TIMBER FLOORING.
CL2	WALL CLADING ALUCOBOND 'ANTHRACITE GREY'	LVR	METAL LOUVRES COLORBOND 'MONUMENT'	UT1	SOLAR HOT WATER SYSTEM.

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A1 ORIGINAL SIZE

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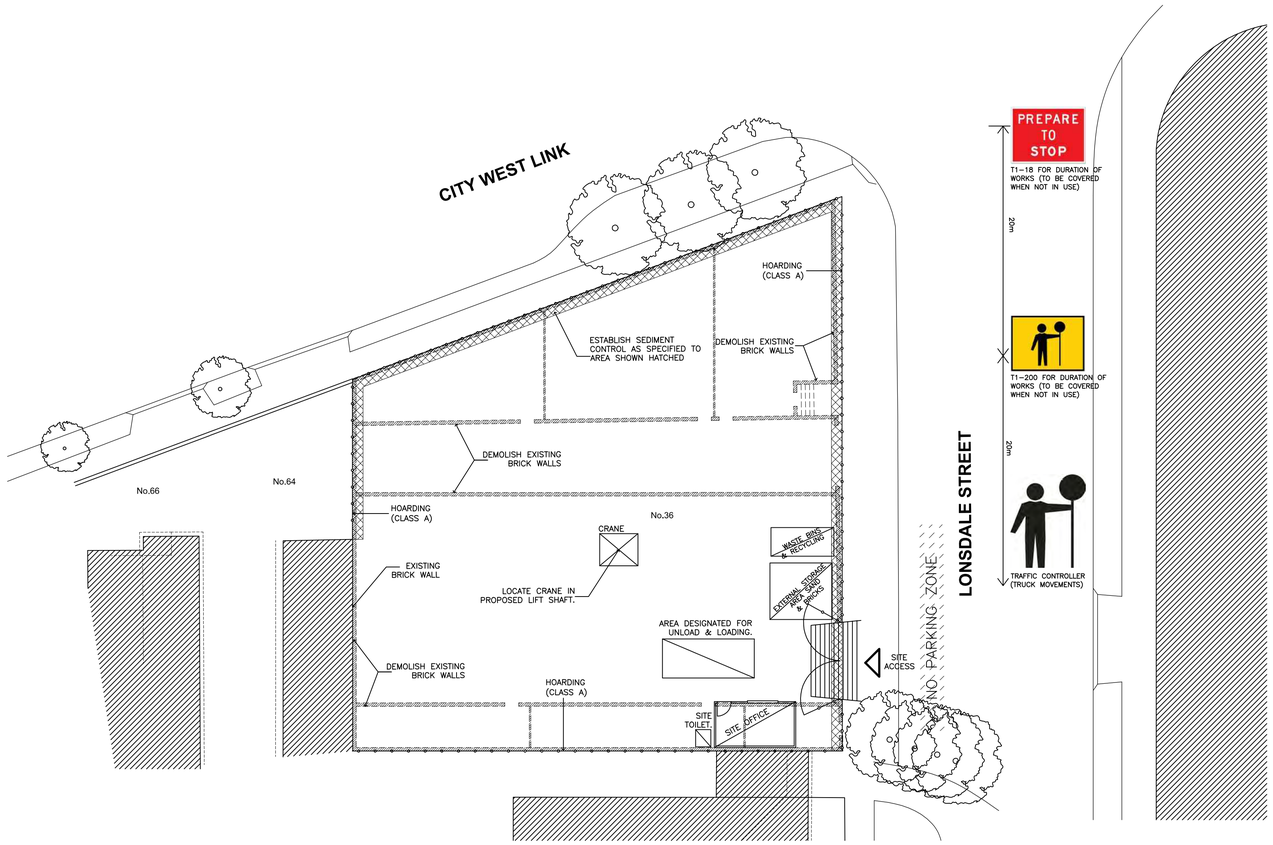
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
SOUTH & WEST ELEVATIONS

DATE	JAN 2015	DRAWING No.	10
SCALE	1:100 @ A1		
JOB No.	D1430		
DRAWN BY	DR		

PRELIMINARY



SITE MANAGEMENT PLAN

CONSTRUCTION NOISE/ DEMOLITION

- ALL EXCAVATION WORK TO BE CARRIED OUT DURING DAYS/HOURS AS PER DEVELOPMENT APPROVAL
- ALL DEMOLITION TO BE CARRIED OUT IN A CAREFUL AND SYSTEMATIC MANNER WITH MINIMUM INCONVENIENCE TO ADJOINING PROPERTIES.
- DEBRIS SHOULD BE WATERED TO REDUCE DUST DURING DEMOLITION

SAFETY

- SITE TO BE SECURELY LOCKED AFTER HOURS
- SIGN TO BE FIXED OUTLINING "DANGER. DO NOT ENTER."
- ALL OTHER REQUIREMENTS TO BE IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT.

SOIL AND WATER MANAGEMENT.

REFER TO SEDIMENT & EROSION CONTROL PLAN

TREE PRESERVATION

- ALL TREES IN THE VICINITY OF THE WORK AREA SHALL BE PROTECTED FROM DAMAGE BY:–
- STRAPPING PALINGS AROUND THE BASE OF THE TRUNK.
- PLACING STAKES AROUND THE DRIP LINE OF THE TREE TO PREVENT EXCAVATION OR DAMAGE TO THE ROOTS IN THIS AREA.

GENERAL NOTES

- ENSURE A COPY OF ALL DOCUMENTS RELATING TO THE CONSTRUCTION CERTIFICATE APPROVAL INCLUDING DEVELOPMENT CONSENT ARE KEPT ON SITE AT ALL TIMES.

SEDIMENT & EROSION CONTROL PLAN

GENERAL

G1 These drawings shall be read in conjunction with the architectural and other consultants' drawings / specifications and with other such written instructions as may be issued during the construction. Any discrepancy shall be referred to the Architect before commencing the work.

G2 All dimensions are in millimeters, UNO (unless noted otherwise).

G3 These drawings shall not be scaled, refer to dimensions given only or refer to the Architectural drawings.

G4 All levels and setting out dimensions shown on the drawings shall be checked on site prior to the commencement of the work.

G5 During construction the structure shall be maintained in a stable condition with no part being overstressed.

G6 Existing services, where shown, have been drawn based on supplied information and as such their accuracy can not be guaranteed. It is the responsibility of the contractor to determine their exact location prior to the commencement of work.

G7 All service trenches under vehicular pavements shall be back filled in accordance with the respective authorities requirements.

G8 All trench backfill material shall be compacted to the same density as the surround material.

G9 All site disturbed areas shall be reinstate to the original condition, including kerbs, footpaths, concrete areas, gravel and grassed areas, playground etc.

G10 It is the contractor's responsibility to obtain all authority approvals.

SEDIMENT & EROSION CONTROL NOTES

E1 The sediment & erosion controls shall be maintained effectively for the duration of the project. They shall not be removed until the site has been stabilized or landscaped to the principal certifying authorities satisfaction.

E2 A single all weather access way shall be provided at the front of the property consisting of 50–80 mm aggregate or similar material with a minimum thickness of 150 mm laid over needle–punched geotextile fabric (Bidim A14 or similar) and installed prior to any works being commenced on site.

E3 A shaker pad must be installed as part of the vehicular accessway. The shaker pad shall be:
- Established on suitable prepared & compacted material.
- Constructed such that it is flush with the adjoining surfaces.
- Designed with rungs spaced 200–250 mm apart & with a maximum width of 75 mm each.

E4 The contractor shall ensure that no spoil or fill encroaches upon adjacent areas during the project.

E5 The contractor shall ensure that all kerb inlets and drains affected by stormwater flow from the site are protected at all times during the project. Kerb inlet sediment traps shall be installed along the immediate vicinity along the street frontage. These shall be regularly maintained during the project.

E6 The street / road shall be kept clean from dirt and debris from vehicles departing the site.

E7 Sediment fencing shall be secured to posts (please note that if star pickets or similar are used then plastic safety caps shall be installed on top of the posts) at 2000 mm intervals with the geotextile fabric embedded a minimum of 200 mm in to the soil.

E8 All the topsoil stripped from the site shall be stockpiled such that it does not interfere with drainage lines and stormwater inlet pits. The stockpile shall be suitably covered with an impervious membrane and screened by sediment fencing.

SOIL CONSERVATION NOTE:

C1 Prior to the commencement of the site works the following shall be provided to capture water borne sediments:
- Sediment fencing
- Sediment trap
- Washout area

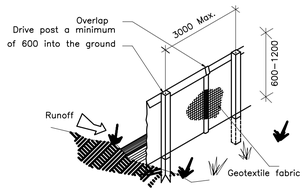
C2 These shall be maintained regularly during the course of the construction with the sediment trap cleaned after each storm event.

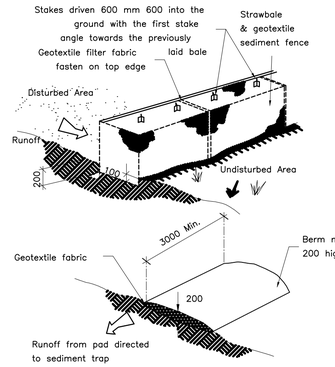
SEDIMENT FENCE

F1 Provide sediment fence on down slope boundary as shown on plan.

F2 Geotextile fabric to be buried 200 mm below ground at the lower edge.

F3 Drainage area is 0.5 HA with a maximum slope gradient 1:2 maximum and a maximum slope length of 50 m.





VEHICLE ACCESS TO SITE

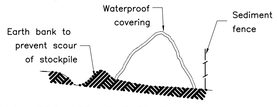
V1 Vehicle access to the building site shall be restricted to a single point so as to reduce the amount of soil deposited on the street pavement.

BUILDING MATERIAL STOCKPILES

M1 Where there are stockpiles of material on site they shall be located at least 2000 mm away from any hazard including surfaces with grades greater than 15 %, away from zones of concentrated stormwater flows, away from driveways, temporary vehicular accessways, footpaths, nature strips, kerbs, open swales & the drip zone of trees.

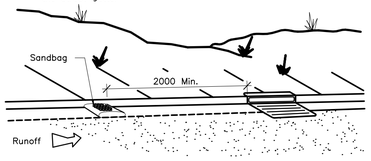
M2 Sediment fencing shall be installed downslope of all stockpiles.

M3 The stockpile shall be covered with a impervious cover and held down firmly at all corners and sides.



SANDBAG KERB SEDIMENT TRAP

K1 In certain circumstances extra sediment trapping may be needed in the street gutter



IMPORTANT !

SITE REMEDIATION.

- REFER TO REMEDIAL ACTION PLAN.

DIAL BEFORE YOU DIG
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USE OF PREMISES.

MATERIALS ON SITE	REUSE AND RECYCLING	DISPOSAL
RECYCLABLES	TEMPORARY STORAGE BINS – PAPER/CARDBOARD – GLASS AND ALUMINIUM – PLASTICS	TO RECYCLERS
NON RECYCLABLES	TEMPORARY STORAGE BINS – FOODSCRAPS – OTHER PLASTICE – UNRECYCLABLE WASTE	TO LANDFILL SITE BY WASTE CONTRACTORS

DEMOLITION, CONSTRUCTION AND USE OF PREMISES. DEMOLITION STAGES

MATERIALS ON SITE		DESTINATION		
TYPE OF MATERIAL	ESTIMATED VOLUME (m^3)	ON-SITE	OFF-SITE	DISPOSAL
EXCAVATION MATERIAL	TBC	KEEP & REUSE TOPSOIL FOR LANDSCAPING, USE SOME BEHIND RETAINING WALLS.	NIL	NIL
GREEN WASTE	TBC	SEPARATED. SOME CHIPPED & STORED ONSITE FOR REUSE ON LANDSCAPING.	NIL	NIL
CONCRETE & ASPHALT	TBC	FILL	NIL	REMAINDER (USELESS) TO KIMBRIKI LANDFILL SITE, MONA VALE RD, TERREY HILLS
BRICKS	TBC	CLEAN & REUSE LIME MORTAR BRICKS.	CONCRETE MORTAR BRICKS TO KIMBRIKI WASTE RECYCLING, MONA VALE RD, TERREY HILLS	NIL
GLASS METAL	TBC	NIL	TO KIMBRIKI RECYCLERS, MONA VALE RD, TERREY HILLS	NIL

DEMOLITION, CONSTRUCTION AND USE OF PREMISES. CONSTRUCTION STAGES

MATERIALS ON SITE		DESTINATION		
TYPE OF MATERIAL	ESTIMATED VOLUME (m^3)	ON-SITE	OFF-SITE	DISPOSAL
EXCAVATION MATERIAL		REFER TO DEMOLITION STAGE		
GREEN WASTE		REFER TO DEMOLITION STAGE		
BRICKS	TBC	NIL	REMAINDER TO KIMBRIKI RECYCLERS, MONA VALE RD, TERREY HILLS	NIL
TIMBER	TBC	NIL	TO KIMBRIKI RECYCLERS, MONA VALE RD, TERREY HILLS	NIL
METALS	TBC	NIL	TO KIMBRIKI RECYCLERS, MONA VALE RD, TERREY HILLS	REMAINDER TO KIMBRIKI LANDFILL SITE, MONA VALE RD, TERREY HILLS

Construction Noise

1. The contractor is to use the best available techniques to meet EPA (DECC) construction noise requirements and to comply with Australian Standard 2436–1981 'Guide to Noise Control on Construction, Maintenance and Demolition Sites', as far as practicable.

Prior to commencement of work

2. Tree protection fencing must be erected around all trees as indicated in the above plan. The fencing must be constructed of 1.8 metres 'cyclone chainmesh fence' or star pickets spaces at 2.4m intervals, connected by continuous high–visibility barrier/hazard mesh at a height of 1 metre.
3. The tree protection fencing must be installed and inspected prior to the commencement of works.
4. All required tree protection measures are to be maintained in good condition for the duration of the construction period.
5. No activities, storage or disposal of materials shall take place beneath the canopy of any tree protected under Council's Tree Preservation Order at any time.
6. The Proponent must ensure that all machinery is cleaned of soil and debris before entering or exiting the site to prevent the spread of weeds and fungal pathogens.
7. A copy of the certified plans, specifications and documentation shall be kept on site at all times and shall be available for perusal by any officer of Council.
8. All deposits, bonds and/or bank guarantees must be paid in accordance with council's requirements prior to commencement.

Road Opening Permit

9. The opening of any footway, roadway, road shoulder or any part of the road reserve shall not be carried out without a Road Opening Permit being obtained from the Council (upon payment of the required fee) beforehand.

Erosion and Drainage Management

10. Prior to the commencement of works suitable erosion and sediment controls measures must be put in place in accordance with the guidelines set out in the NSW Department of Housing Manual Managing Urban Stormwater: Soil and Construction, to the satisfaction of the PCA.

During work on–site

11. a) The hours of demolition or construction, including delivery of materials to and from the site, shall be restricted as follows:
i) Between 7.00am and 5.00pm, Monday to Saturday, ii) No work or deliveries on Sunday and/or public holidaysb) Works and deliveries may be undertaken outside these hours where:
i) The delivery of materials is required by the Police or other authorities; or
ii) A variation to the working hours is authorised in writing by the principal certifying authority.
12. All vehicles involved in the excavation/or demolition process and departing the property with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.
13. All materials on–site or being delivered to the site must be contained within the site. The requirements of the Protection of the Environment Operations Act 1997 are to be complied with when placing/stockpiling loose material or when disposing of waste products or during any other activities likely to pollute drains or watercourses.
14. During excavation, demolition and construction, adequate measures shall be taken to prevent dust from affecting the amenity of the neighbourhood. The following measures must be adopted:
– physical barriers shall be erected at right angles to the prevailing wind direction or shall be placed around or over dust sources to prevent wind or activity from generating dust.
– earthworks and scheduling activities shall be managed to coincide with the next stage of development to minimise the amount of time the site is left cut or exposed.
– all materials shall be stored or stockpiled at the best locations.
– the ground surface should be dampened slightly to prevent dust from becoming airborne but should not be wet to the extent that run–off occurs
– all vehicles carrying spoil or rubble to or from the site shall at all times be covered to prevent the escape of dust.
– all equipment wheels shall be washed before exiting the site using manual or automated sprayers and drive–through washing bays.
– gates shall be closed between vehicle movements and shall be fitted with shade cloth.
– cleaning of footpaths and roadways shall be carried out daily.
15. during excavation, demolition and construction phases, toilet facilities are to be provided on the work site, at the rate of one toilet for every 20 persons or part of 20 persons employed at the site.
16. Should any new information come to light during demolition or construction works which has the potential to alter previous conclusions about site contamination the architect and principal certifier shall be notified and works must cease.
17. Any demolition work must be carried out in accordance with AS 2601––2001, The Demolition of Structures, published by Standards Australia on 13 September 2001
18. All waste generated by the project, shall be beneficially reused, recycled or directed to a waste facility lawfully permitted to accept the materials in accordance with the Waste Classification Guidelines (DECC 2008) and the Protection of the Environment Operations Act 1997.
19. The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.
20. Where required, the adjustment or inclusion of any new utility service facilities must be carried out by the applicant and in accordance with the requirements of the relevant utility authority and at the proponents full cost. It is the applicant's full responsibility to make contact with the relevant utility authorities to ascertain the impacts of the proposal upon utility services (including water, phone, gas and the like).

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- CIRCULATION
- PRE-DA
- DA
- CC
- TENDER
- CONSTRUCTION
- AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
C	JAN 2015	COORDINATION	DR
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A	DEC 2014	ISSUE TO CLIENT	DR

CLIENT
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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
SITE MANAGEMENT PLAN

DATE	JAN 2015	DRAWING No.	
SCALE	1:200 @ A1		12
JOB No.	D1430		
DRAWN BY	DR		

PRELIMINARY

ROOF SHEETING:
COLORBOND 'SURFMIST'
RS1

WALL CLADDING:
ALUCOBOND PANELS 'PURE WHITE'
CL1

WALLS CLADDING:
AUSTRAL BRICK 'OLD COLONIAL' OR SIMILAR
BR1

WALLS CLADDING—FRAMES:
ALUCOBOND 'ANTHRACITE GREY'
CL2

WINDOWS & DOORS FRAMING:
COLORBOND 'MONUMENT'
W1

GUTTERS & DOWNPIPES:
COLORBOND 'SURFMIST'

GUTTERS & DOWNPIPES:
COLORBOND 'MONUMENT'

METAL FRAMED SCREENS:
COLORBOND 'MONUMENT'
SC1

METAL PANELS:
COLORBOND 'MONUMENT'
SC2

METAL LOUVRES:
COLORBOND 'MONUMENT'
LVR

EXTERNAL FLOOR TILES:
SKHEME RE—EVOLUTION GREY SATIN OR SIMILAR
T1

BALUSTRADE:
GLASS & STAINLESS STEEL
BL1

CARPARK GARAGE DOORS VENTILATED

EXTERNAL FINISHES

CONTRACTOR MAY SELECT SIMILAR FINISHES SUBJECT TO APPROVAL BY THE ARCHITECT.

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
EXTERNAL FINISHES

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No.
13

PRELIMINARY

CITY WEST LINK

LONSDALE STREET

GUTTER

FALL

FALL

RS1

RS1

RISER

RIDGE

GUTTER

GUTTER

ALUMINIUM FRAMED SKYLIGHTS. VELUX OR SIMILAR

GUTTER

LIFT OVER -RUN

STEEL FRAMED PERGOLA

TERRACE BELOW

ROOF TERRACE

ROOF OF ADJOINING BUILDING No.64 BRENAN ST

SHADOW DIAGRAM - PLAN

21 JUNE 9am

L E G E N D

ADDITIONAL SHADOW CAST

SHADOW CAST

EXTENT OF EXISTING SHADOW CAST

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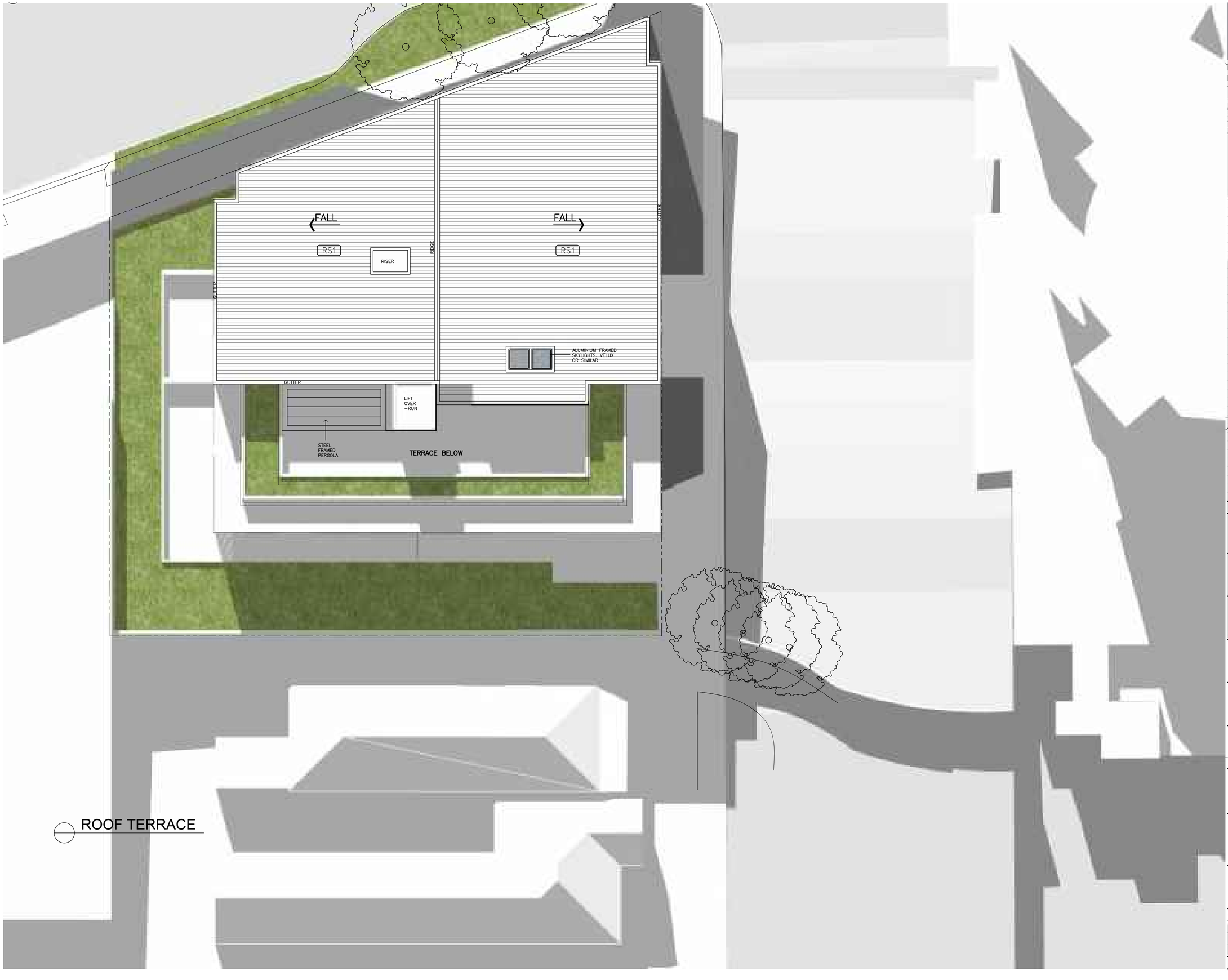
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
DIAGRAMS - SHADOW 9am

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No.
15

PRELIMINARY



ROOF TERRACE

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
DIAGRAMS - SHADOW 12pm

DATE	DEC 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No.
16

PRELIMINARY

CITY WEST LINK

LONSDALE STREET

FALL

FALL

RS1

RS1

RISER

RIDGE

GUTTER

GUTTER

GUTTER

ALUMINIUM FRAMED SKYLIGHTS. VELUX OR SIMILAR

LIFT OVER –RUN

STEEL FRAMED PERGOLA

TERRACE BELOW

ROOF TERRACE

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
DIAGRAMS - SHADOW 3pm

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No.
17

PRELIMINARY

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- ( ) DA
- ( ) CC
- ( ) TENDER
- ( ) CONSTRUCTION
- ( ) AS-BUILT

A1 ORIGINAL SIZE

SHADOW DIAGRAM -ELEVATION

21 JUNE 3pm 402 Catherine St view from Lonsdale St

L E G E N D

ADDITIONAL SHADOW CAST

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PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
ELEVATION SHADOWS

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 18

PRELIMINARY

21 JUNE - 9:00 AM

21 JUNE - 10:00 AM

21 JUNE - 11:00 AM

21 JUNE - 12:00 PM

21 JUNE - 01:00 PM

21 JUNE - 02:00 PM

21 JUNE - 03:00 PM

SOLAR ACCESS

APARTMENTS

16 APARTMENTS OUT OF 22 ACHIEVES AT LEAST 3 HOURS OF DIRECT SUN LIGHT

TOTAL 16 OF 22 UNITS

PERCENTAGE OF UNITS WITH SOLAR ACCESS 72.7%

SEPP 65 REQUIREMENT 70%
LEICHHARDT DCP 70%

SUN ANALYSIS

0 - 1 - 2 - 3 - 4 - 5 - 6 = TOTAL SUN HOURS

SOLAR ACCESS _ APARTMENTS

No.	9am	10am	11am	12noon	1pm	2pm	3pm
U1	0	1	2	3	4	5	6
U2	0	1	2	3	4	5	6
U3	0	1	2	3	4	5	6
U4	0	0	0	0	0	0	0
U5	0	0	0	0	0	0	0
U6	0	0	0	0	1	2	3
U7	0	1	2	3	4	5	6
U8	0	1	2	3	4	5	6
U9	0	1	2	3	4	5	6
U10	0	0	0	0	0	0	0
U11	0	0	0	0	0	0	0
U12	0	0	0	0	1	2	3
U13	0	1	2	3	4	5	6
U14	0	1	2	3	4	5	6
U15	0	1	2	3	4	5	6
U16	0	0	0	0	0	0	0
U17	0	0	0	0	0	0	0
U18	0	0	0	0	1	2	3
U19	0	1	2	3	4	5	6
U20	0	1	2	3	4	5	6
U21	0	1	2	3	4	5	6
U22	0.5	1	2	3	3	3	3

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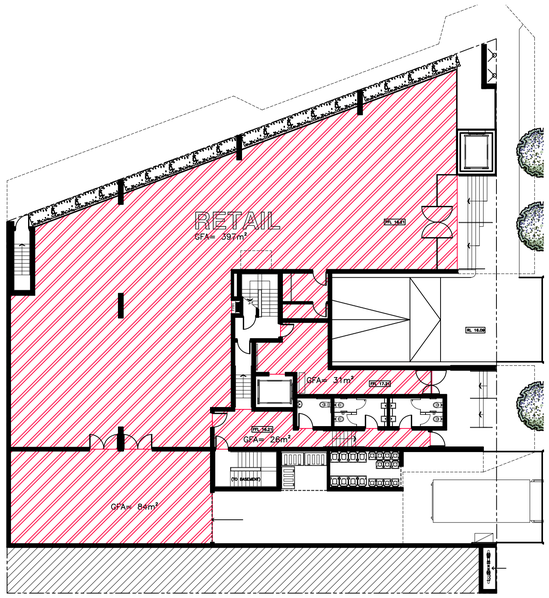
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
SOLAR ACCESS

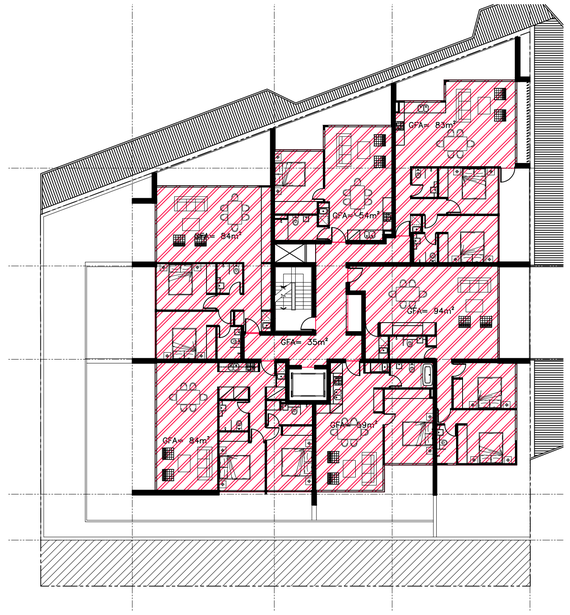
DATE	JAN 2015	DRAWING No.
SCALE	1:200 @ A1	19
JOB No.	D1430	
DRAWN BY	DR	

PRELIMINARY



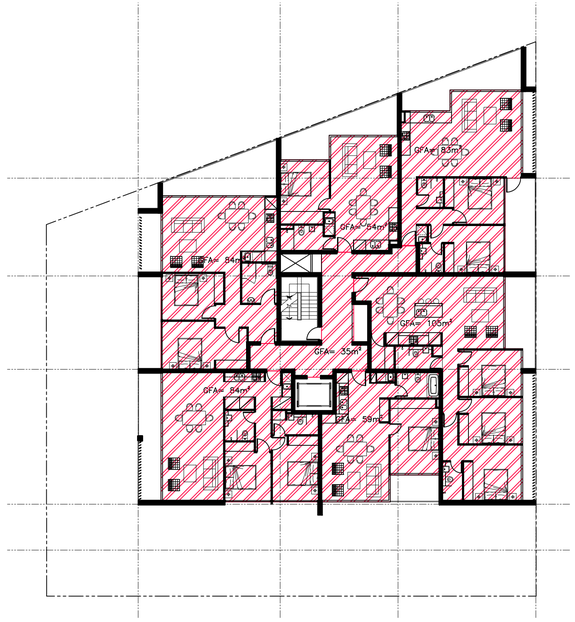
GROUND FLOOR

GROSS FLOOR AREA (GFA)
TOTAL = 538.0m²



FIRST FLOOR

GROSS FLOOR AREA (GFA)
TOTAL = 493.0m²



SECOND FLOOR

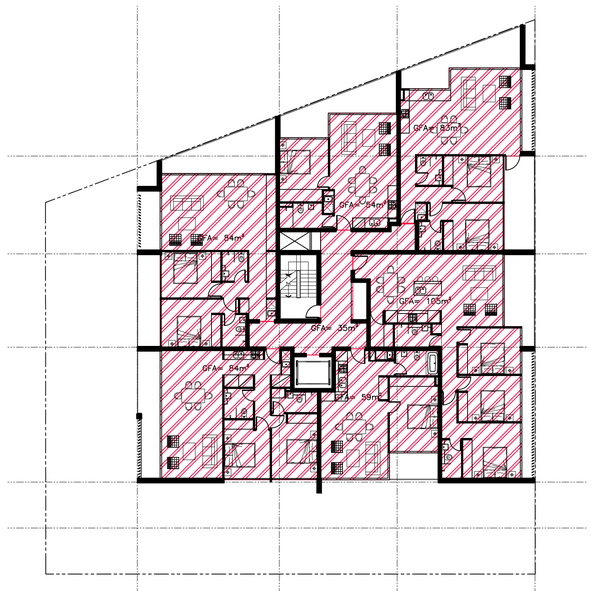
GROSS FLOOR AREA (GFA)
TOTAL = 504.0m²

GROSS FLOOR AREA

- GROUND FLOOR = **538.0m²**
- FIRST FLOOR = **493.0m²**
- SECOND FLOOR = **504.0m²**
- THIRD FLOOR = **504.0m²**
- ROOF TERRACE = **323.0m²**

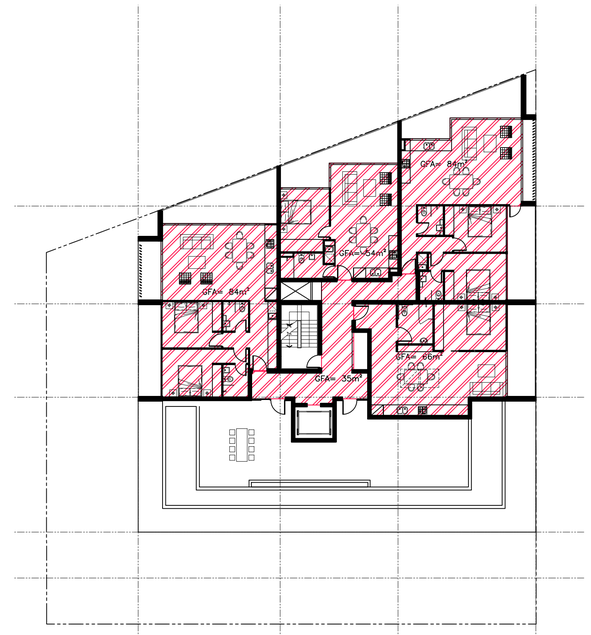
TOTAL = **2362.0m²**
SITE = **966.2m²**

FSR = 2.44:1



THIRD FLOOR

GROSS FLOOR AREA (GFA)
TOTAL = 504.0m²



ROOF TERRACE

GROSS FLOOR AREA (GFA)
TOTAL = 323.0m²

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info@derekraithby.com.au Architect #7469

- (●) CIRCULATION
- ( ) PRE-DA
- ( ) DA
- ( ) CC
- ( ) TENDER
- ( ) CONSTRUCTION
- ( ) AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
C	JAN 2015	COORDINATION	DR
B	JAN 2015	COORDINATION	DR
A	DEC 2014	ISSUE TO CONSULTANTS	DR

CLIENT
OZZY STATES Pty Ltd
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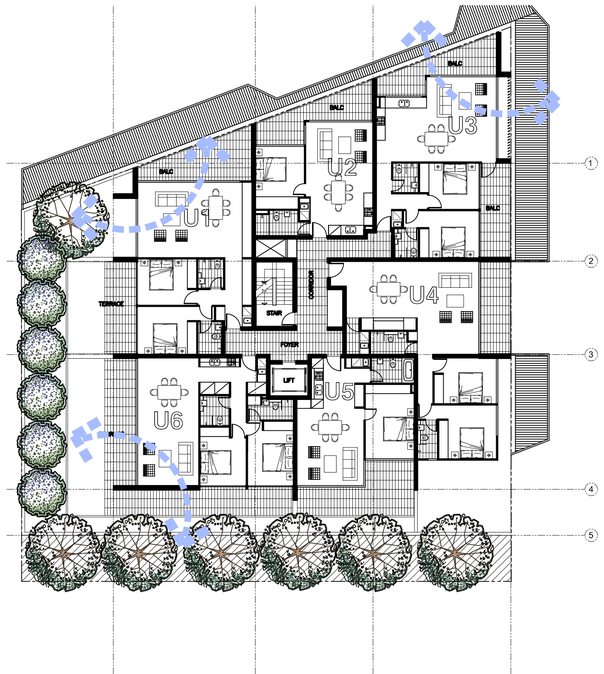
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
DIAGRAMS
- GFA

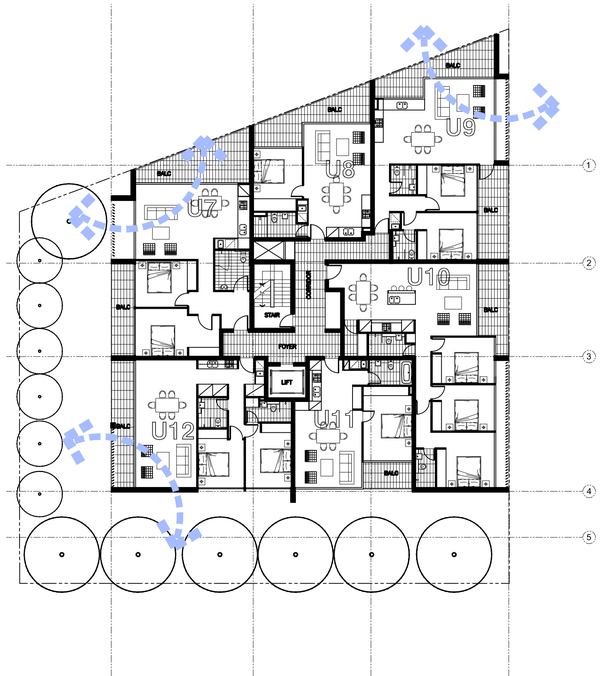
DATE	JAN 2015
SCALE	1:200 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 20

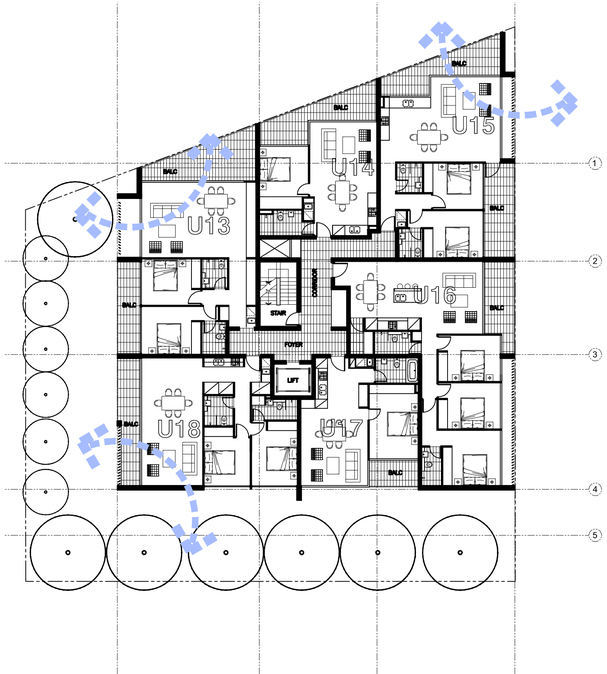
PRELIMINARY



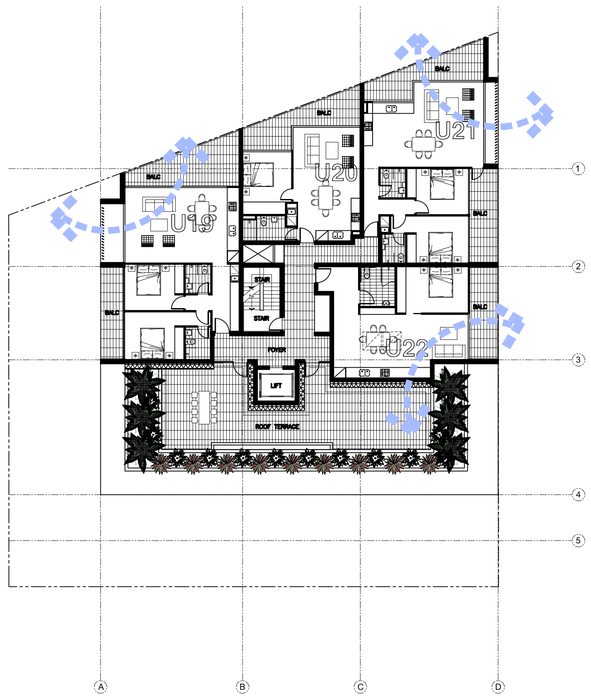
FIRST FLOOR



SECOND FLOOR



THIRD FLOOR



ROOF TERRACE

NATURAL VENTILATION

APARTMENTS

NUMBER OF UNITS WITH CROSS / CORNER VENTILATION	12 OF 22
PERCENTAGE OF UNITS WITH CROSS / CORNER VENTILATION	55%
SEPP 65 REQUIREMENT	60%

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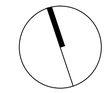

- (●) CIRCULATION
- ( ) PRE-DA
- ( ) DA
- ( ) CC
- ( ) TENDER
- ( ) CONSTRUCTION
- ( ) AS-BUILT

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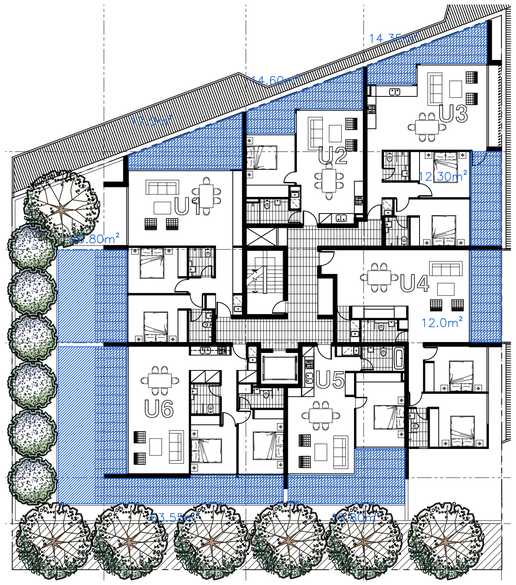
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

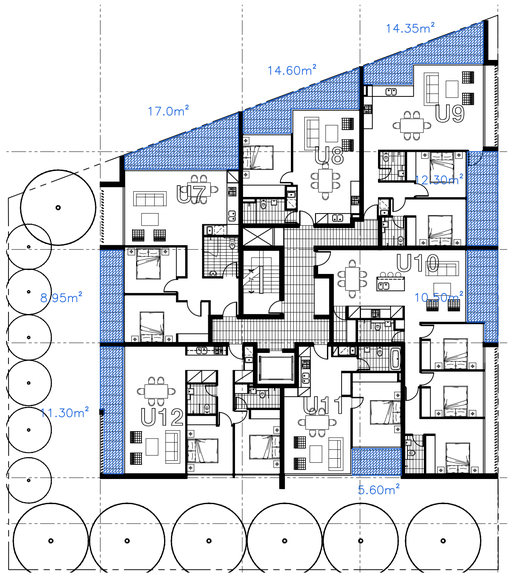
DRAWING TITLE
DIAGRAMS
NATURAL VENTILATION

DATE	JAN 2015	DRAWING No.
SCALE	1:200 @ A1	21
JOB No.	D1430	
DRAWN BY	DR	

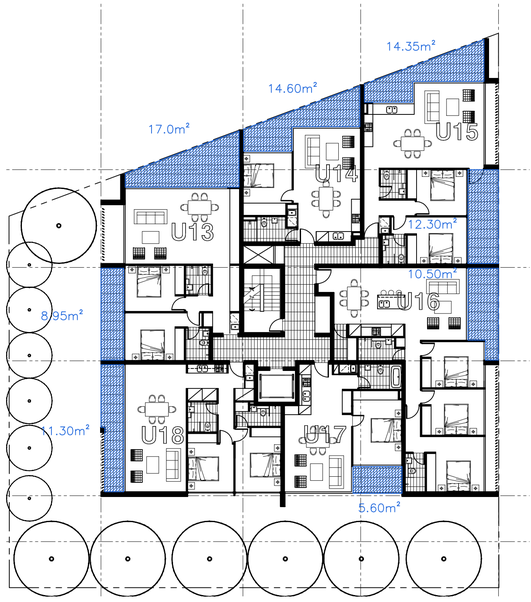
PRELIMINARY



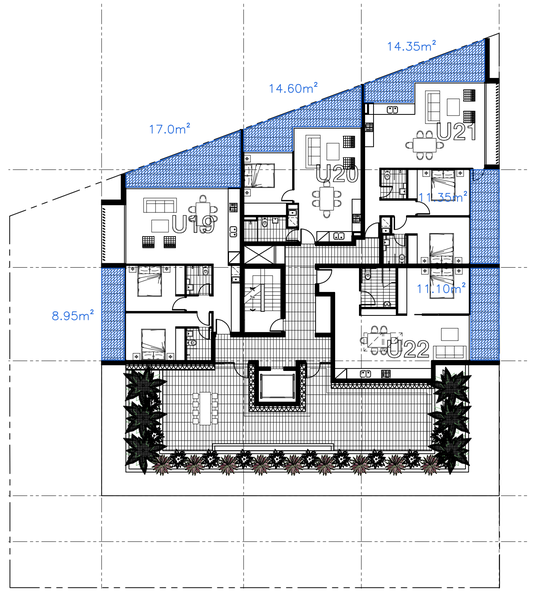
FIRST FLOOR
PRIVATE OPEN SPACES & BALCONIES
TOTAL=180.4 m²



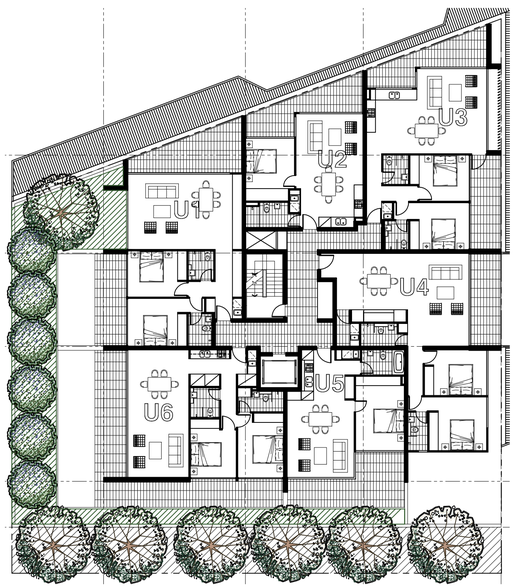
SECOND FLOOR
PRIVATE OPEN SPACES & BALCONIES
TOTAL=94.60 m²



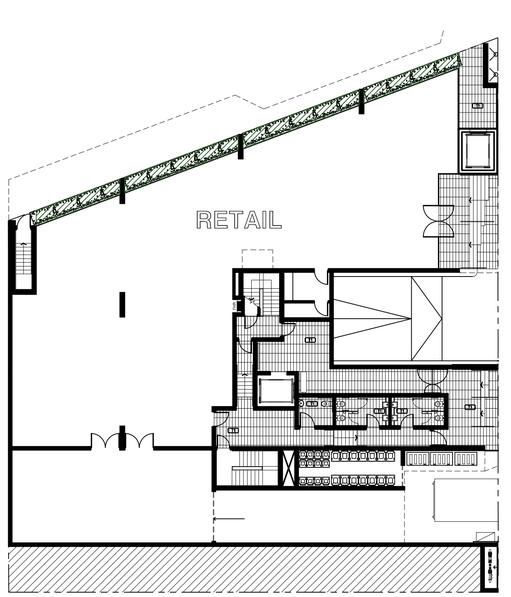
THIRD FLOOR
PRIVATE OPEN SPACES & BALCONIES
TOTAL=94.60 m²



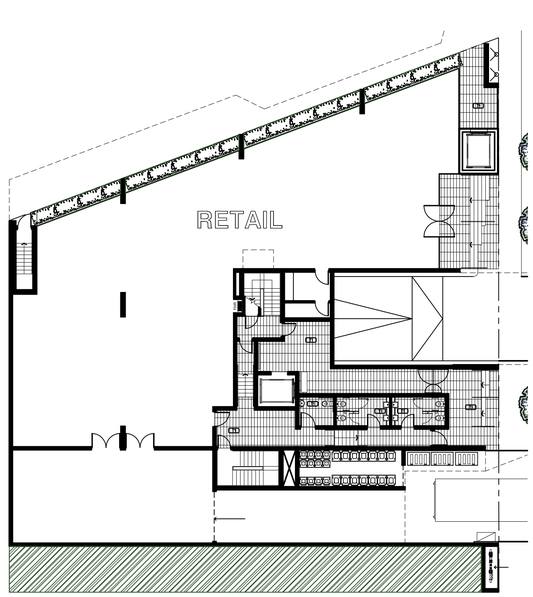
ROOF TERRACE
PRIVATE OPEN SPACES & BALCONIES
TOTAL=77.4 m²



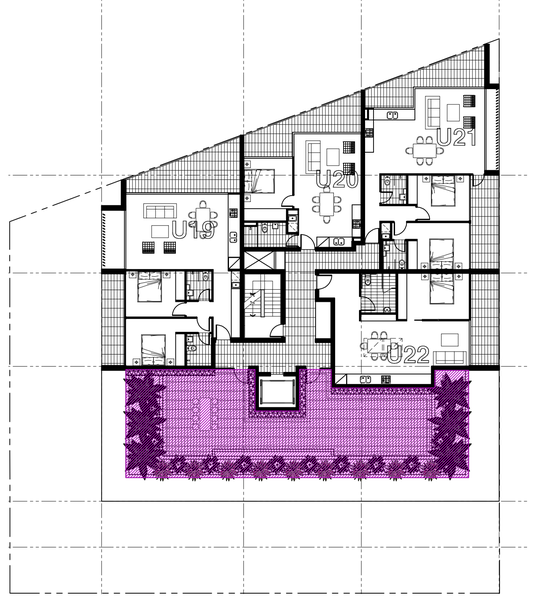
FIRST FLOOR
LANDSCAPE (NO DEEP SOIL)
TOTAL = 104.60m²



GROUND FLOOR
LANDSCAPE (NO DEEP SOIL)
TOTAL = 26.75m²



GROUND FLOOR
DEEP SOIL
TOTAL = 92.70m²



ROOF TERRACE
COMMUNAL OPEN SPACE (COS)
TOTAL=141.9m²

POS TOTAL = 447m²

LANDSCAPE = 131.4m² (NOT DEEP SOIL)

DEEP SOIL = 92.70 OR 10%

COS TOTAL = 141.9m² OR 15%

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A1 ORIGINAL SIZE

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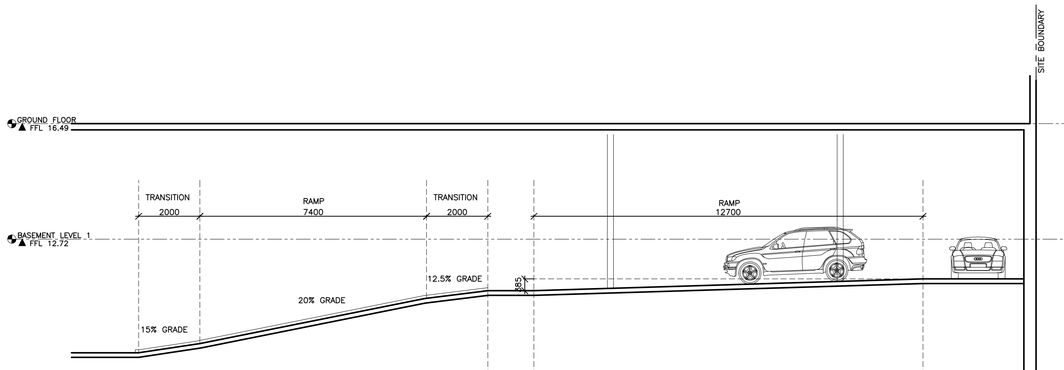
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
DIAGRAMS
POS / LANDSCAPE / COS

DATE	JAN 2015	DRAWING No.
SCALE	NTS @ A1	22
JOB No.	D1430	
DRAWN BY	DR	

PRELIMINARY



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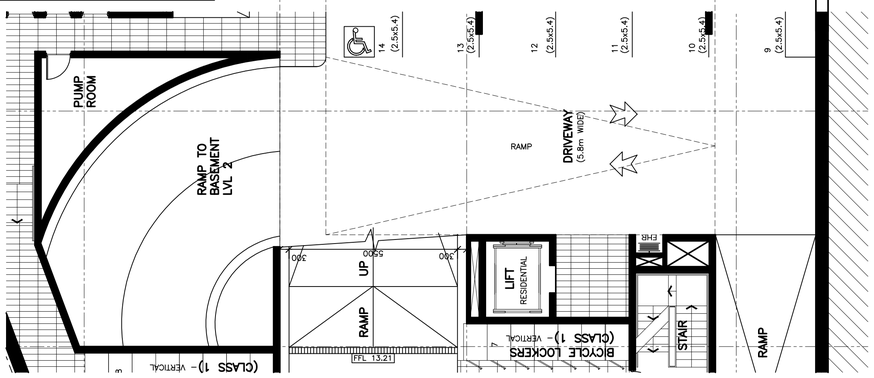
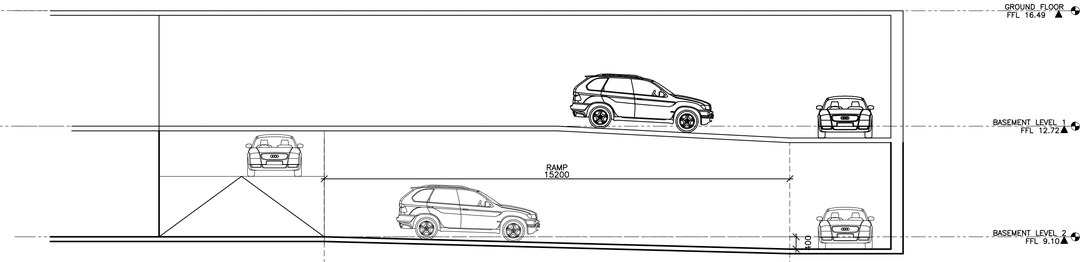


BASEMENT FLOOR LEVEL 1



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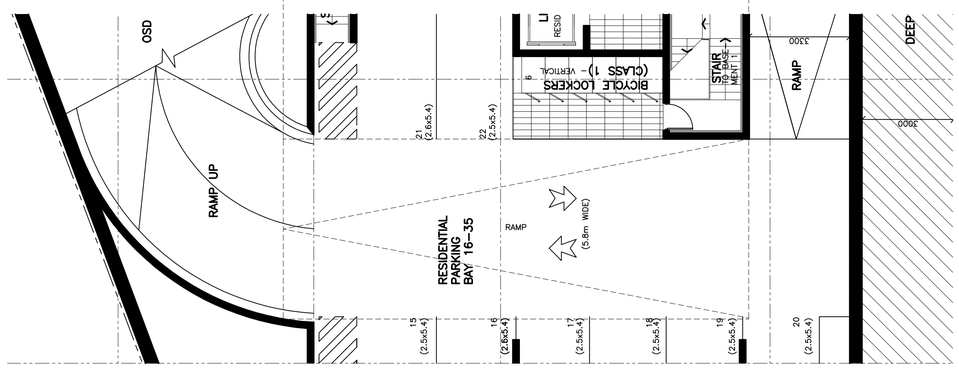
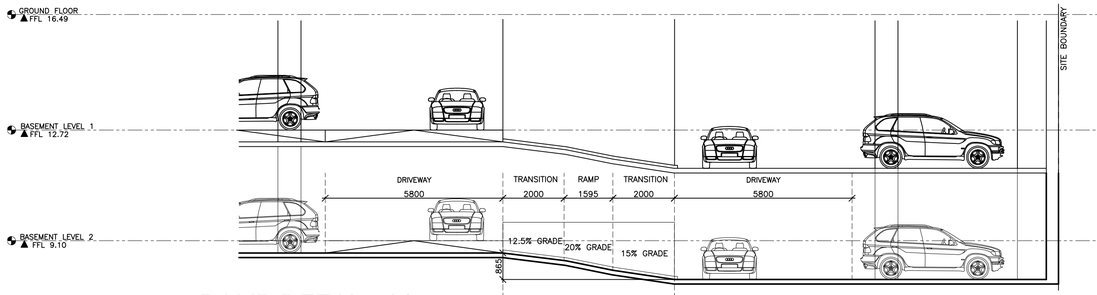


BASEMENT FLOOR LEVEL 2



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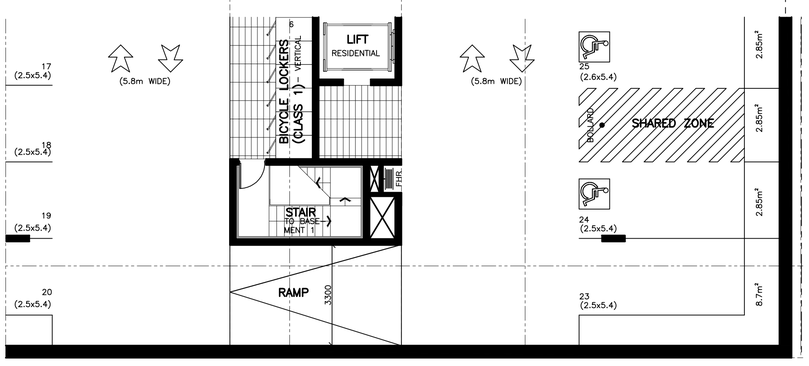
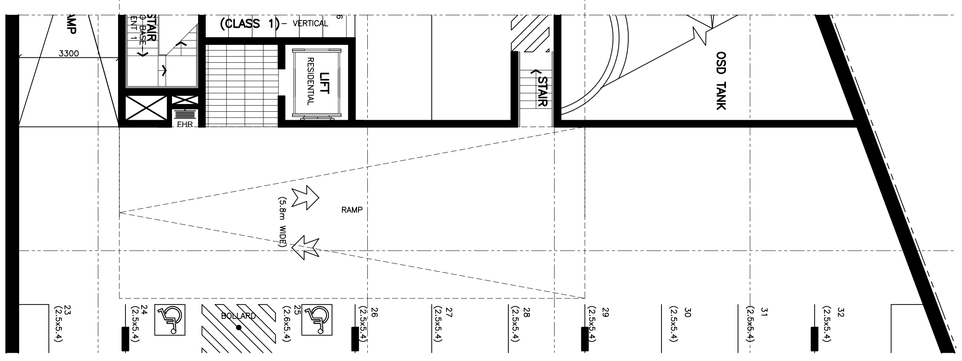


BASEMENT FLOOR LEVEL 2



BASEMENT FLOOR LEVEL 2

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- CIRCULATION
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- DA
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A1 ORIGINAL SIZE

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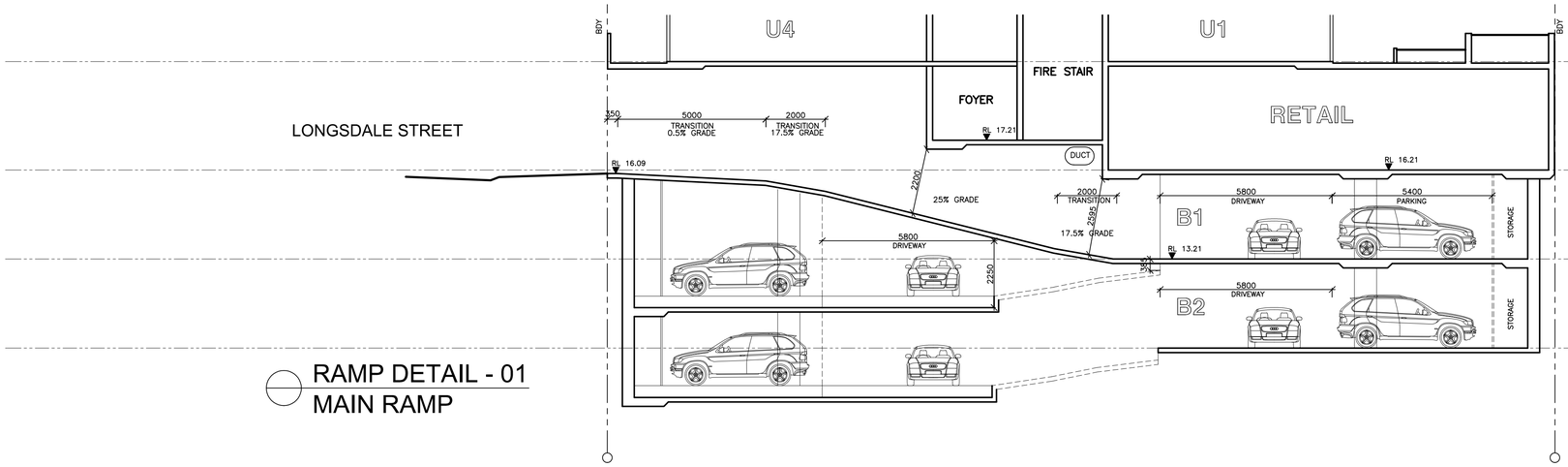
PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
DRIVEWAY PROFILE

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 23

PRELIMINARY



RAMP DETAIL - 01
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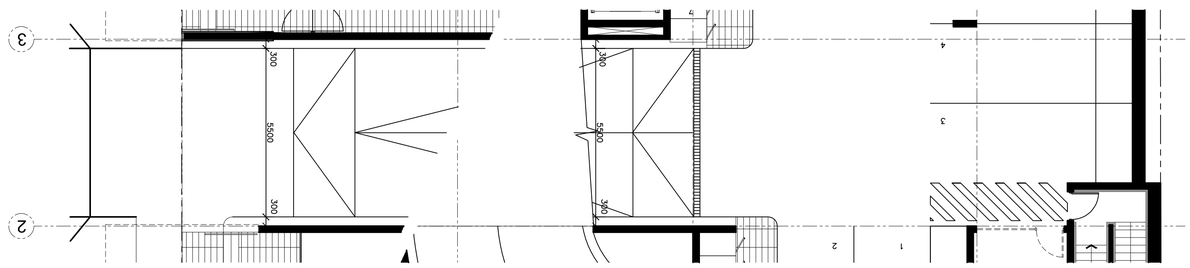

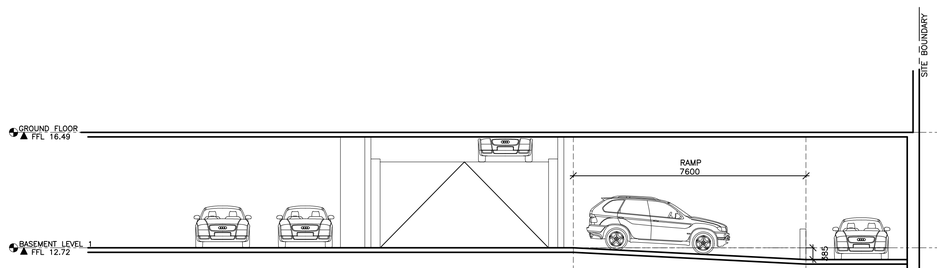

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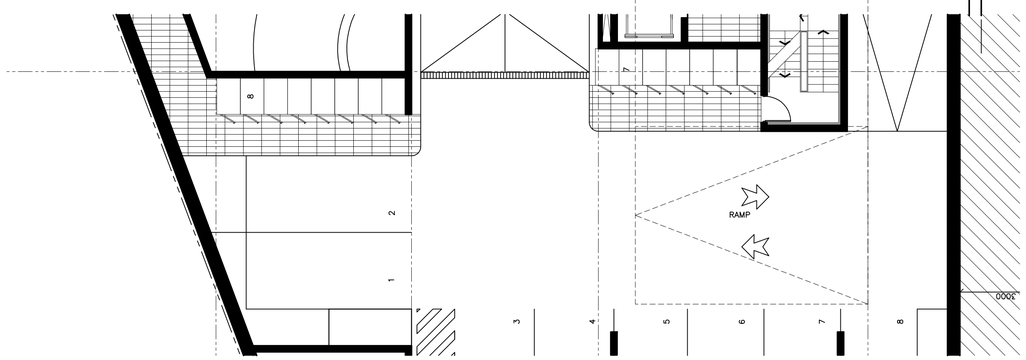
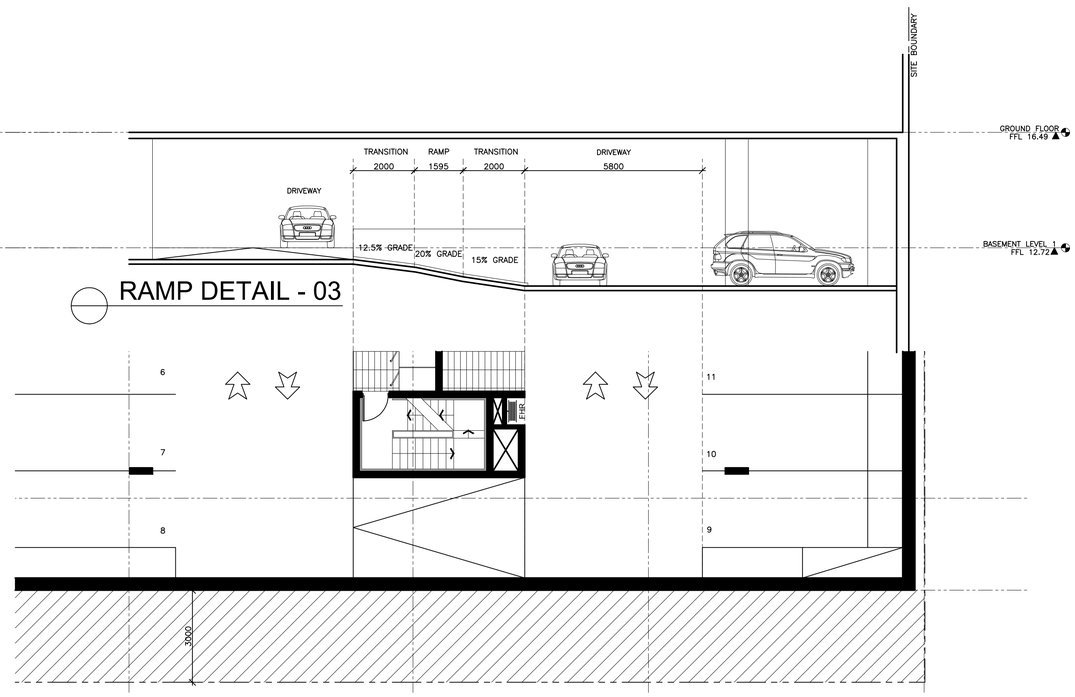


BASEMENT FLOOR LEVEL 1



RAMP DETAIL - 03

BASEMENT FLOOR LEVEL 1

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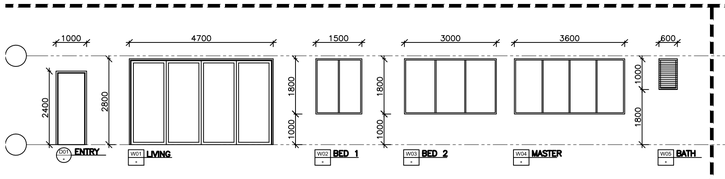
DRAWING TITLE
DRIVEWAY PROFILE

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No. 24

PRELIMINARY



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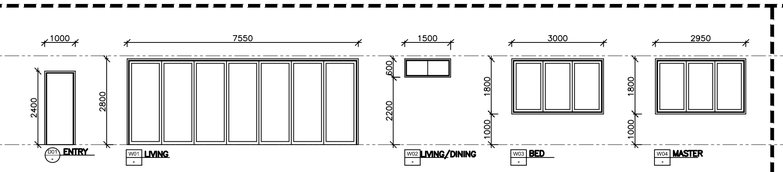

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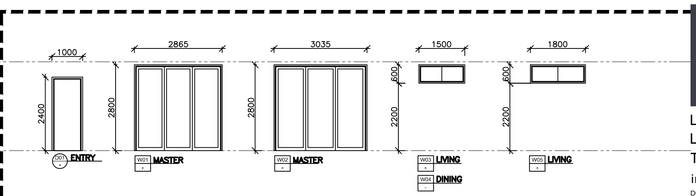

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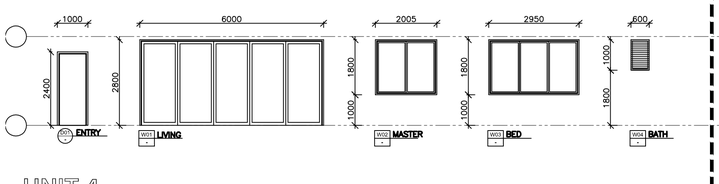

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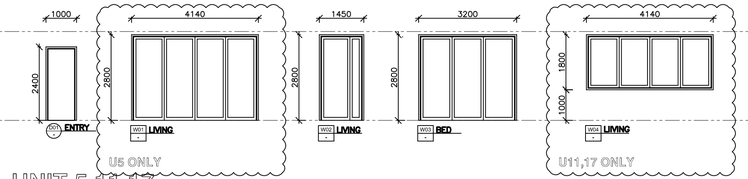

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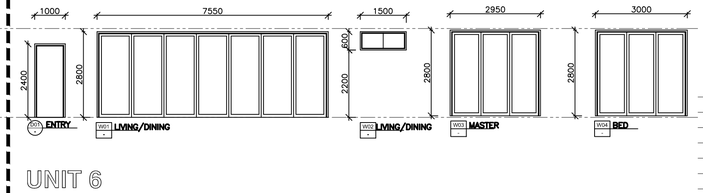

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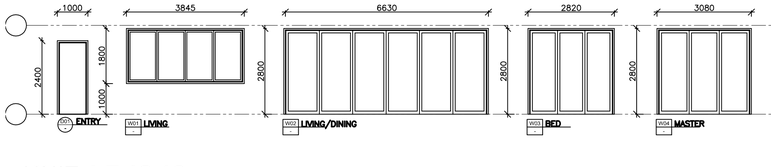

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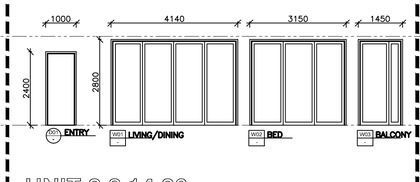

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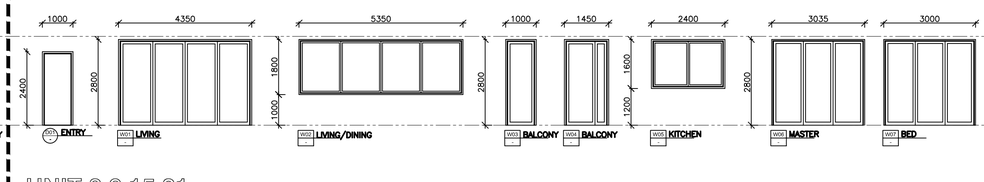
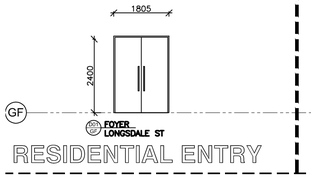
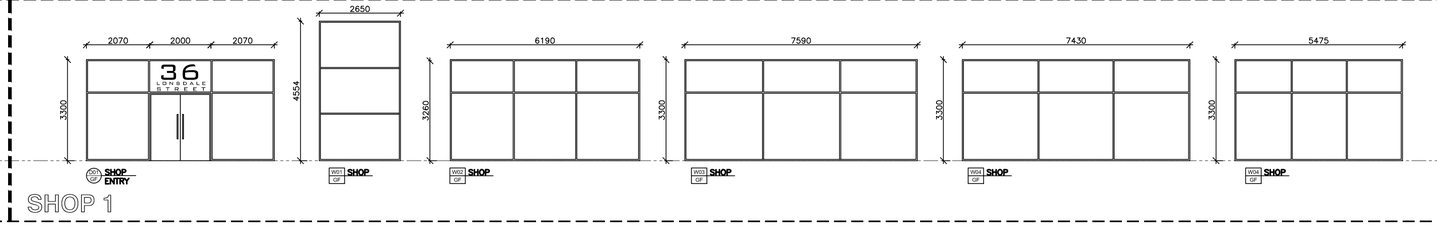


UNIT 3,9,15,21



RESIDENTIAL ENTRY



SHOP 1

IMPORTANT NOTE
CHECK BASIX
COMMITTMENTS

LEGEND:

F+ FIXED GLASS

DOOR REFERENCE

WINDOW REFERENCE

GF- GROUND FLOOR

FF- FIRST FLOOR

TIMBER SCREEN FOR PRIVACY ONLY.

GENERAL NOTES:

1. UNLESS NOTED OTHERWISE, DOORS ARE VIEWED EXTERNALLY FROM ROOM.
2. ALL WINDOW & DOOR SIZES ARE STRUCTURAL SIZES AND SHOWN IN MILLIMETERS.
3. ALL DIMENSIONS ARE TO BE CONFIRMED ON SITE.
4. THESE DRAWINGS ARE DIAGRAMMATIC AND SHOP DRAWINGS ARE TO BE SUBMITTED BY THE SELECTED SUBCONTRACTOR.
5. ALL DIMENSIONS ARE NOMINAL AND DO NOT INDICATE ARCHITRAVES.
6. ALL GLAZING SHALL COMPLY WITH THERMAL COMMITMENTS AS OUTLINED IN THE SECTION J REPORT/CERTIFICATE.
7. TENDERER / SUB CONTRACTOR IS TO INCLUDE THE FOLLOWING WHEN PRICING:
   - WEATHER SEALS
   - KEY LOCKS, 2x SETS OF KEYS
   - MANUFACTURER & BUILDER ARE TO CHECK DOOR SWING/ HINGE LOCATION INCLUDING HARDWARE PRIOR TO MANUFACTURE.
8. WHERE REQUIRED, PROVIDE HINGES WHICH ARE REMOVABLE AND COMPLY WITH BCA PART 3.8.3.3.

LEVEL 2, 57 RENWICK STREET,
LEICHHARDT NSW 2040
T: (02) 9518 3563 ABN: 86738976625
info@derekraithby.com.au Architect #7469

- CIRCULATION
- PRE-DA
- DA
- CC
- TENDER
- CONSTRUCTION
- AS-BUILT

A1 ORIGINAL SIZE

ISSUE	DATE	AMENDMENT	BY
C	JAN 2015	COORDINATION	DR
B	JAN 2015	COORDINATION	DR
A	JAN 2015	ISSUE TO CONSULTANTS	DR

CLIENT
OZZY STATES Pty Ltd
C/O APP CORPORATION Pty LIMITED

PROJECT MANAGEMENT / TOWN PLANNER
APP CORPORATION PTY LIMITED
116 Miller Street Ph: (02) 9956 1295
North Sydney NSW 2060 elise.cramer@app.com.au

HYDRAULIC ENGINEER
EWFW
Suite 5, Level 330 Waltle Street Ph: (02) 9212 1000
Ultimo, NSW 2007 luke.degioia@ewfw.com.au

TRAFFIC ENGINEER
GTA Consultants
Level 6,15 Help Street, Ph: (02) 8448 1800
Chatswood, NSW 1515 jason.rudd@gta.com.au

LANDSCAPE DESIGN
Paterson design Studio
16a/1-15 Tramore Place Ph: (02) 9922 5312
Killarney Heights, NSW 2087 garth@pdsdesign.com.au

GEOTECHNICAL/CONTAMINATION
Environmental Investigations (EI)
Suite 6.01, 55 Miller Street Ph: (02) 9516 0722
Pyrmont NSW 2009 voula.terlegas@eiaustralia.com.au

BCA CONSULTANT
Vic Lilli & Partners
Suite 7 Level 2,1-17 Elsie Street
Burwood NSW 2134 Ph: (02) 9715 2555
ntruong@dartechdesign.com.au

PROJECT
MIXED USE DEVELOPMENT
36 LONSDALE STREET
LILYFIELD, NSW

DRAWING TITLE
WINDOW SCHEDULE

DATE	JAN 2015
SCALE	1:100 @ A1
JOB No.	D1430
DRAWN BY	DR

DRAWING No.
25

PRELIMINARY

APPENDIX B
Borehole Logs

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

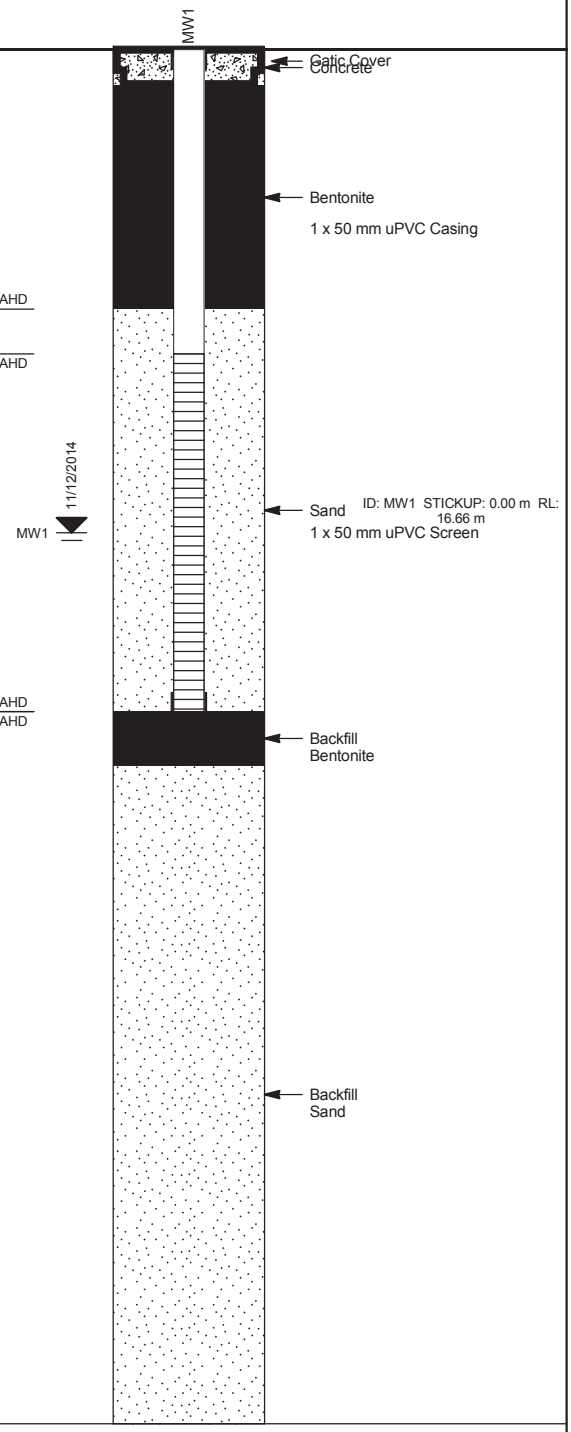
Hole ID
MW1

CLIENT	: Ozzy States Pty Ltd	POSITION	: Refer to Figure 2	SHEET	: 1 OF 1
CONTRACTOR	: Traccess	EASTING	: 330196.8 m	STATUS	:
PROJECT	: New Residential Development	NORTHING	: 6250230.6 m	LOGGED BY	: SF
LOCATION	: 36 Lonsdale Street, Lilyfield	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 11/12/2014
PROJECT No.	: E22390	GROUND RL	: 16.66 m AHD		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
DT					FILL: CONCRETE; 150 mm.
AD/T	GWNE		16		FILL: SAND; medium grained, poorly graded, brown-orange with some medium to coarse sub-angular to sub-rounded sandstone gravel.
		1			From 0.9 m, dark grey-grey.
					From 1.3 m, orange-brown, trace clay, gravel is fine to medium sub-angular sandstone.
NMLC	80-90% RETURN		15		SANDSTONE; medium to coarse grained, pale brown with orange iron staining, inferred low to medium strength, inferred distinctly weathered.
		2			SANDSTONE; medium to coarse grained, bedding dipping 5-10 degrees, pale brown with orange iron staining.
					From 2.23 m, pale grey-grey, laminated with siltstone and shale 1-5 mm thick average spacing = 5-20 mm.
			14		
		3			
			13		
		4			
			12		
		5			
	50-60% RETURN		11		
		6			
			10		From 6.2 m, bedding dipping 10-20 degrees.
		7			
			9		
		8			Hole Terminated at 7.68 m Target depth reached, converted into monitoring well.

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
MW1	Standpipe	0.00 m 16.66 m	3.70 m 12.96 m	11/12/2014	2.70m



RIG	:	CHECKED BY	:	REMARK
INCLINATION	:	CHECKED DATE	:	
AZIMUTH	:	APPROVED BY	:	
HOLE DIA.	:	APPROVED DATE	:	

BOREHOLE: BH1

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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					-	FILL: CONCRETE; 200 mm thick.	-		CONCRETE HARDSTAND
				0.20								
AD/T	-	GWNE			BH1_0.2-0.4 ES 0.20-0.40 m			-	FILL: Gravelly SAND; fine to medium grained, poorly graded, brown to dark brown, trace ash, gravel is coarse to fine, angular, weak hydrocarbon odour.	M	-	FILL
			0.5	*0.50*					Hole Terminated at 0.50 m Refusal on sandstone.			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

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

BOREHOLE: BH2

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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					-	FILL: CONCRETE; 180 mm thick.	-		CONCRETE HARDSTAND
				0.18								
AD/T	-	GWNE			BH2_0.2-0.4 ES 0.20-0.40 m			-	FILL: Gravelly SAND; fine to medium grained, poorly graded, brown to dark brown, trace ash, gravel is coarse to fine, angular, weak hydrocarbon odour.	M		FILL
			0.5		BH2_0.4-0.6 ES 0.40-0.60 m							
				0.60								
					BH2_0.6-0.8 ES 0.60-0.80 m			-	SANDSTONE; Inferred extremely weathered, inferred low strength, yellow grey, no odour.		-	WEATHERED ROCK
			1.0							D		
				1.20	BH2_1.2-1.4 ES 1.20-1.40 m							
				1.40				-	FILL: CONCRETE;	-	-	CONCRETE HARDSTAND
			1.5	1.60								
									Hole Terminated at 1.60 m Refusal on burried concrete slab.			
			2.0									
			2.5									
			3.0									

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

BOREHOLE: BH3

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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	0.12				-	FILL: CONCRETE; 120 mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE		0.40	BH3_0.2-0.4 ES 0.20-0.40 m			SP	SAND; fine to medium grained, poorly graded, yellow to orange, no odour.	M	-	RESIDUAL SOIL
			0.5						Hole Terminated at 0.40 m Refusal on sandstone.			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

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

BOREHOLE: BH4

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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					-	FILL: CONCRETE; 150 mm thick.	-		CONCRETE HARDSTAND
				0.15								
HA	-	GWNE			BH4_0.2-0.4 ES 0.20-0.40 m			SP	SAND; fine to medium grained, poorly graded, yellow to orange, no odour.	M	-	RESIDUAL SOIL
				0.40								
									Hole Terminated at 0.40 m Refusal on sandstone.			
			0.5									
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

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

BOREHOLE: BH5

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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					-	FILL: CONCRETE; 200 mm thick.	-		CONCRETE HARDSTAND
				0.20								
AD/T	-	GWNE			BH5_0.2-0.4 ES 0.20-0.40 m			-	FILL: Clayey SAND; fine to medium grained, poorly graded, brown red grey, clay is medium plasticity, inferred stiff, no odour.		-	FILL
			0.5		BH5_0.6-0.8 ES 0.60-0.80 m							
				0.90					From 0.9 m, becoming black, stained, mild hydrocarbon odour.	M		
			1.0		BH5_1.0-1.2 ES 1.00-1.20 m							
				1.20				-	SANDSTONE; Inferred extremely weathered, inferred low strength, yellow grey, mild hydrocarbon odour.			WEATHERED ROCK
			1.5		BH5_1.3-1.5 ES 1.30-1.50 m							
				1.60					Hole Terminated at 1.60 m Refusal on sandstone.			
			2.0									
			2.5									
			3.0									

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

BOREHOLE: BH6

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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	*0.12*				-	FILL: CONCRETE; 120 mm thick	-		CONCRETE HARDSTAND
HA	-	GWNE	0.5	*0.70*	BH6_0.2-0.4 ES 0.20-0.40 m BH6_0.5-0.7 QC ES 0.50-0.70 m QD1/QT1 ES 0.50-0.70 m			-	FILL: Gravelly SAND; fine to medium grained, poorly graded, brown to dark brown, trace ash, gravel is coarse to fine, angular, no odour.	M	-	FILL
			1.0						Hole Terminated at 0.70 m Refusal on sandstone.			
			1.5									
			2.0									
			2.5									
			3.0									

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

BOREHOLE: BH7

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	36 Lonsdale Street, Liliyfield			Date Started	2/3/15
Position	Refer to Figure 2			Date Completed	2/3/15
Job No.	E22390	Contractor	Hart Geo Pty Ltd	Logged DS	Date: 2/3/15
Client	Ozzy States Pty Ltd	Drill Rig	Ute-Mounted Rig	Checked VT	Date: 5/3/15
		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	0.0					-	FILL: CONCRETE; 150 mm thick.	-	-	CONCRETE HARDSTAND
				0.15								
HA					BH7_0.15-0.3 ES 0.15-0.30 m			-	FILL: SAND; fine to medium grained, yellow, no odour.	M	L	FILL
				0.30								
									Hole Terminated at 0.30 m Refusal on burried concrete slab.			
			0.5									
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									

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

Environmental Investigations Australia

Contamination | Remediation | Geotechnical

METHOD OF SOIL DESCRIPTION USED ON BOREHOLE AND TEST PIT LOGS

FILL

COUBLES or BOULDERS

GRAVEL (GP or GW)

ORGANIC SOILS (OL, OH or Pt)

SILT (ML or MH)

CLAY (CL, CI or CH)

SAND (SP or SW)

Combinations of these basic symbols may be used to indicate mixed materials such as sandy clay

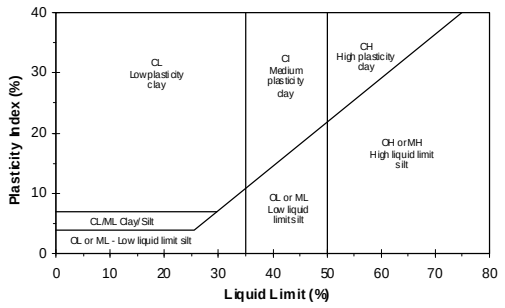
CLASSIFICATION AND INFERRED STRATIGRAPHY

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 >2.36mm	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 <2.36mm	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%

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

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

APPENDIX C
Field Data Sheets & Calibration Certificates

ENVIRONMENTAL INVESTIGATIONS GROUNDWATER SAMPLING FIELD SHEET

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Site Address: 36 Lonsdale St Lilyfield	Job Number: E22390
Client: 0224 States P/L	Date: 9/3/15
Field Staff: EW	Well ID: MW1
Well Location: refer to plan	Round No:
WELL BACKGROUND	
Well Installation Date: 11/12/14	Well Stickup (m): -0.15
Initial Well Depth (mbgl): 3.7	Screen Interval (mbgl): 1.7 - 3.7
Previous Sampling Date:	Previous SWL (m):
PRE PURGE	
Well Head Condition: Good	PID Headspace (ppm): NP
Total Well Depth (mbgl): 3.7 + 0.15	Water Measure Device: O
SWL (mbtoc): 1.825	Purge Vol = Water Column x 6 (50mm Well)
Water Column (m):	Purge Volume (L): 5
PHASE SEPARATED HYDROCARBONS(PSH)	
Depth to PSH (mbtoc): no	PSH Visually Confirmed:
PID Headspace (ppm):	PSH Thickness (mm):
LOW FLOW: PURGING & SAMPLING	
Depth of Pump Inlet: 2.0m	Fill Timer: [illegible] 11
Pump Pressure Regulator (psi): 15 - 18	Discharge Timer: 3
Weather Conditions: Sunny	Cycle: 9
Pump on time: 12pm	Pump off time: 12:20
Weather Conditions:	

WATER QUALITY PARAMETERS

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (uS/cm)	Redox (mV)	DO (mg/L)	pH	Comments (colour, turbidity, odour etc.)
	1	1.825	27.5	977	-154	0	6.9	dark brown high turbidity,
	1		26.9	1132	-160	0	7.1	poor clarity, low sediment,
	1		25.1	1485	-50	0	7.33	slight HC odour, sheen
	1		25.1	1489	-47.1	0	7.32	present, no PSH
	1	1.925	25.1	1488	-46.5	0	7.33	
Stabilisation range: 3 consecutive readings				+/- 3%	+/- 10mV	+/- 10%	+/- 0.05	

OTHER COMMENTS: QAQC

Environmental Investigations Australia
Contamination | Remediation | Geotechnical

Water Quality Meter Calibration Log

Instrument: Hanna Multi Parameter 9828 – Serial no. 08267834

Room Temperature: 26.5 °C

Sensor (Unit of measure)	Standard Solutions Used	Solution Batch Number	Instrument Reading	
			Initial	Post Calibration
pH	4.01 6.86 9.18	LJ 1685 LH 2141 LK 2227	4.14 6.96 9.12	4.01 6.86 9.18
ORP (mV)	240	4010K	212.9	240.4
Conductivity (µs/cm)	1413 µS/cm 13255 µS/cm	LL1202 LC1376	1511 13.02 mS/cm	1478 13.26 mS/cm
DO (mg/L)	100 % (Air) 0%	6276/6275	112.7 0	100.1 0
Temperature (°C)	25.5	N/A	25.67	25.5

Calibrated by: CY

Calibration Date: 11/2/2015

Next Calibration Due: March 2015

Notes:

.....

.....

APPENDIX D
Chain of Custody and Sample Receipt Forms

Sheet 1 of 2

Site: 36 Lonsdale St Lilyfield

Project No: EZ2390

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	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	HOLD			TCLP PAHs	TCLP HM [A]	TCLP HM [B]
1	BH1-0.2-	0.4	J, ZLB	2/3/15			✓		X															
2	BH2-0.2-	0.4	↓						X															
	0.4-	0.6	↓																					
3	0.6-	0.8	J							X														
	1.2-	1.4	J																X					
4	BH3-0.2-	0.4	J, ZLB						X															
5	BH4-0.2-	0.4	↓						X															
6	BH5-0.2-	0.4	↓						X															
7	-0.6-	0.8	↓							X														
	-1.0-	1.2	↓																X					
8	-1.3-	1.5	J							X														
9	BH6-0.2-	0.4	J, ZLB				↓		X															

RECEIVED
02 MAR 2015
SE136783

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

- ☐ 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 (SGS):
DANIEL SOLIMAN	
Print	Print
Signature	Signature
Date 2/3/15	Date 02/03/15 @3:30

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 2

Site: 36 Lonsdale St Lilyfield

Project No: E22390

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	TCLP PAHs	TCLP HM [A]	TCLP HM [B]
10	BH6-0.5-0.7		J, ZLB	2/3/15			↓		X													
11	BH7-0.15-0.3		"						X													
12	QD1		J								X											
13	TB1		VC×2			X							X									
14	RB1		S, VC×2, P	↓		X					X											

Comments

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

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

- ☐ 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): DANIEL SOLIMAN
Print
Signature
Date 2/3/15

Received by (SGS):
Print
Signature
Date 02/03/15 @ 3:30

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

SGS

Job SR136783

	Matrix	250 JAR	125 JAR	BAG			1L UP P	500 UP P	250 ZnAcetate P	250 / 500 NaOH BP	125 / 250 UP P	125 / 250 Metal Total*	125 / 250 Metal Filtered*	125 HCl P	500 UP AG	500 / 1L H_2SO_4 AG	125 / 250 H_2SO_4 P	100 / 200 UP AG	40 NaThio GV	250 UP OPAQUE P	500 NaThio STERILE P	200 NaThio STERILE P						Storage Location	Bottles Supplied By	Comment	Cooling Method
1-12	Soil	1																										S609-10	Sug	Full	Temp
13	Water																		2									W077	"	"	3.6
14	"												1		1				2									"	"	"	Good Order
1,2,4-7,9-11	Soil			1																								ASB	"	75g	(Y) / N
																															Clearly Labelled
																															(Y) / N
																															Correct Pres.
																															(Y) / N
																															No Head-space
																															(Y) / N / NA
																															Sufficient Vol
																															(Y) / N
																															Doc Date
																															02/03
																															Doc Type
																															Complete Docs
																															Y / N
																															Requested TAT

3 Soil on hold

• This Sample Bottle labelled as BH2-0.3-0.4

SAMPLE RECEIPT ADVICE

SE136783

CLIENT DETAILS

Contact	Daniel Soliman
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Daniel.Soliman@eiaustralia.com.au
Project	**E22390 - 36 Lonsdale st - Lilyfield**
Order Number	**E22390**
Samples	14

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 2/3/2015
Report Due	Thu 5/3/2015
SGS Reference	**SE136783**

SUBMISSION DETAILS

This is to confirm that 14 samples were received on Monday 2/3/2015. Results are expected to be ready by Thursday 5/3/2015. Please quote SGS reference SE136783 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	12 Soils & 2 Waters	Type of documentation received	COC
Date documentation received	2/3/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.6°C
Sample container provider	SGS	Turnaround time requested	Three Days
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

3 soil samples have been placed on hold as per client's request.

SAMPLE RECEIPT ADVICE

SE136783

CLIENT DETAILS

Client Environmental Investigations

Project E22390 - 36 Lonsdale st - Lilyfield

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 from	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH1_0.2-0.4	28	13	25	11	7	10	12	8
002	BH2_0.2-0.4	28	13	25	11	7	10	12	8
003	BH2_0.6-0.8	-	-	25	-	7	10	12	8
004	BH3_0.2-0.4	28	13	25	11	7	10	12	8
005	BH4_0.2-0.4	28	13	25	11	7	10	12	8
006	BH5_0.2-0.4	28	13	25	11	7	10	12	8
007	BH5_0.6-0.8	-	-	25	-	7	10	12	8
008	BH5_1.3-1.5	-	-	25	-	7	10	12	8
009	BH6_0.2-0.4	28	13	25	11	7	10	12	8
010	BH6_0.5-0.7	28	13	25	11	7	10	12	8
011	BH7_0.15-0.3	28	13	25	11	7	10	12	8
012	QD1	-	-	-	-	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

SE136783

CLIENT DETAILS

Client Environmental Investigations

Project E22390 - 36 Lonsdale st - Lilyfield

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
001	BH1_0.2-0.4	2	1	1	-	-	-
002	BH2_0.2-0.4	2	1	1	-	-	-
003	BH2_0.6-0.8	-	1	1	-	-	-
004	BH3_0.2-0.4	2	1	1	-	-	-
005	BH4_0.2-0.4	2	1	1	-	-	-
006	BH5_0.2-0.4	2	1	1	-	-	-
007	BH5_0.6-0.8	-	1	1	-	-	-
008	BH5_1.3-1.5	-	1	1	-	-	-
009	BH6_0.2-0.4	2	1	1	-	-	-
010	BH6_0.5-0.7	2	1	1	-	-	-
011	BH7_0.15-0.3	2	1	1	-	-	-
012	QD1	-	1	1	-	-	-
013	TB1	-	-	-	-	12	-
014	RB1	-	-	-	9	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

SE136783

CLIENT DETAILS

Client Environmental Investigations

Project E22390 - 36 Lonsdale st - Lilyfield

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS
014	RB1	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 .

SAMPLE RECEIPT ADVICE

SE136783A

CLIENT DETAILS

Contact	Voula Terlegas
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street PYRMONT NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Voula.Terlegas@eiaustralia.com.au
Project	**E22390 -36 Lonsdale Street-Lilyfield-Add**
Order Number	**E22390**
Samples	15

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 2/3/2015
Report Due	Wed 11/3/2015
SGS Reference	**SE136783A**

SUBMISSION DETAILS

This is to confirm that 15 samples were received on Monday 2/3/2015. Results are expected to be ready by Wednesday 11/3/2015. Please quote SGS reference SE136783A when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	1 Soil	Type of documentation received	Email
Date documentation received	5/3/15@6:23pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.6°C
Sample container provider	SGS	Turnaround time requested	Three Days
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

SAMPLE RECEIPT ADVICE

SE136783A

CLIENT DETAILS

Client Environmental Investigations

Project E22390 -36 Lonsdale Street-Lilyfield-Add

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
015	BH5_1.0-1.2	1	25	10	12	8

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 .

AU.SampleReceipt.Sydney (Sydney)

From: Voula Terlegas - Environmental Investigations [voula.terlegas@eiaustralia.com.au]
Sent: Thursday, 5 March 2015 6:23 PM
To: AU.SampleReceipt.Sydney (Sydney)
Cc: Crawford, Huong (Sydney)
Subject: RE: Report Job SE136783, your reference E22390 - 36 Lonsdale Street - Lilyfield

SGS Ref: SE136783A
Date Due: 11/3/15
TAT: 3 day

Hi Team,

Could I have sample BH5_1.0-1.2 tested for TPH/BTEX, PAH on a 72Hr TAT?

Should you have any queries, do not hesitate to contact me.

Kind regards,

Voula Terlegas | Environmental & Geotechnical Engineer Environmental Investigations Australia Pty Ltd Suite 6.01, 55 Miller Street, Pyrmont NSW 2009 T 02 9516 0722 | F 02 9518 5088 W www.eiaustralia.com.au | E voula.terlegas@eiaustralia.com.au

-----Original Message-----
From: AU.Environmental.Sydney@SGS.com [mailto:AU.Environmental.Sydney@SGS.com]
Sent: Thursday, 5 March 2015 5:46 PM
To: Daniel Soliman - Environmental Investigations; Laboratory Results - Environmental Investigations
Subject: Report Job SE136783, your reference E22390 - 36 Lonsdale Street - Lilyfield

Dear Daniel,

Please find attached the report for SGS job SE136783, your reference E22390 - 36 Lonsdale Street - Lilyfield, order number E22390.

-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,
Huong Crawford

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:

Environmental Investigations
Suite 6.01, 55 Miller Street
Pyrmont NSW 2009

ph: 9516 0722
Fax: 9518 5088

Attention: Daniel Soliman

Sample log in details:

Your reference:	**E22390, Lilyfield**
Envirolab Reference:	**124396**
Date received:	02/03/15
Date results expected to be reported:	**9/03/15**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	16.2
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

If there is sufficient sample after testing, samples will be held for the following time frames from date of receipt of samples:
Water samples - 1 month
Soil and other solid samples - 2 months
Samples collected in canisters - 1 week. Canisters will then be cleaned.
All other samples are not retained after analysis
If you require samples to be retained for longer periods then retention fees will apply as per our pricelist.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Sheet 1 of 1

Site: 86 Lonsdale St Lilyfield

Project No: E22390

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]
QT1	1	J	2/3/15			x				x														

ENVIROLAB

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

Job No: 124396
Date Received: 2/3/15
Time Received: 15:45
Received by: JYH
Temp: Cool/Ambient 16.2°
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):
Print: DANIEL SOLIMAN	Print: JYH
Signature:	Signature:
Date: 2/3/15	Date: 2/3/15

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

SE137034

CLIENT DETAILS

Contact	Emmanuel Woelders
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Emmanuel.Woelders@eiaustralia.com.au
Project	**E22390 - 36 Lonsdale St - Lilyfield**
Order Number	**E22390**
Samples	3

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 9/3/2015
Report Due	Thu 12/3/2015
SGS Reference	**SE137034**

SUBMISSION DETAILS

This is to confirm that 3 samples were received on Monday 9/3/2015. Results are expected to be ready by Thursday 12/3/2015. Please quote SGS reference SE137034 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	3 Waters	Type of documentation received	COC
Date documentation received	9/3/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.8°C
Sample container provider	SGS	Turnaround time requested	Three Days
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

SAMPLE RECEIPT ADVICE

SE137034

CLIENT DETAILS

Client Environmental Investigations

Project E22390 - 36 Lonsdale St - Lilyfield

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	MW1	1	22	7	9	79	8
002	GWQD1	1	-	7	9	12	8
003	GWQTB1	-	-	-	-	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: 36 Lonsdale St, Lilyfield NSW

Project No: E22340

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	TRH/BTEX	PAHs	VOCs	Asbestos	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	sPOCAS	BTEX			TCLP PAHs	TCLP HM A	TCLP HM B
MW1	1	5 P, VC×2	9/3/15	PM	✓				✓					✓										
GWQD1	2	↓	↓	↓	↓					✓														
GWQTB1	3	VC×2	↓	↓	↓														✓					

SE137034 COC

Received: 09–Mar--2015

RECEIVED
09 MAR 2015
SE137034

Comments

HM A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
ZinC

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

LABORATORY TURNAROUND

- ☐ 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):

Print: Emmanuel Woelders

Signature: EWoelders

Date: 9/3/15

Received by (SGS):

Print:

Signature:

Date: 09/03/15 @ 4.20

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

APPENDIX E
Laboratory Analytical Reports

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Daniel Soliman	Manager	Huong Crawford
Client	Environmental Investigations	Laboratory	SGS Alexandria Environmental
Address	Suite 6.01, 55 Miller Street NSW 2009	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 9516 0722	Telephone	+61 2 8594 0400
Facsimile	02 9516 0741	Facsimile	+61 2 8594 0499
Email	Daniel.Soliman@eiaustralia.com.au	Email	au.environmental.sydney@sgs.com
Project	**E22390 - 36 Lonsdale Street - Lilyfield**	SGS Reference	**SE136783 R0**
Order Number	**E22390**	Report Number	0000104335
Samples	14	Date Reported	05 Mar 2015
Date Started	04 Mar 2015	Date Received	02 Mar 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.
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Deanne Norris
Organic Chemist

Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Asbestos Analyst

Parameter	Units	LOR	Sample Number: SE136783.001 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
VOC's in Soil Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	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
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	<0.1	**0.2**	<0.1	<0.1
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**90**	**83**	**92**	**83**
d4-1,2-dichloroethane (Surrogate)	%	-	**101**	**91**	**103**	**99**
d8-toluene (Surrogate)	%	-	**97**	**90**	**101**	**95**
Bromofluorobenzene (Surrogate)	%	-	**95**	**86**	**97**	**92**
Totals						
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**90**	**83**	**92**	**83**
d4-1,2-dichloroethane (Surrogate)	%	-	**101**	**91**	**103**	**99**
d8-toluene (Surrogate)	%	-	**97**	**90**	**101**	**95**
Bromofluorobenzene (Surrogate)	%	-	**95**	**86**	**97**	**92**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE136783.001 Soil 02 Mar 2015 BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)						
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403						
TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**120**	**580**	<45	<45
TRH C29-C36	mg/kg	45	**150**	**1000**	<45	<45
TRH C37-C40	mg/kg	100	<100	**280**	<100	<100
TRH C10-C36 Total	mg/kg	110	**270**	**1600**	<110	<110
TRH C10-C40 Total	mg/kg	210	**270**	**1900**	<210	<210
TRH F Bands						
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**220**	**1300**	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	**590**	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420						
Naphthalene	mg/kg	0.1	<0.1	**0.5**	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	**0.2**	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	**0.2**	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	**0.5**	**0.2**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	**0.3**	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	**0.4**	**0.3**	<0.1
Phenanthrene	mg/kg	0.1	**0.3**	**6.4**	**2.0**	<0.1
Anthracene	mg/kg	0.1	<0.1	**1.7**	**0.4**	<0.1
Fluoranthene	mg/kg	0.1	**0.6**	**8.1**	**2.6**	**0.1**
Pyrene	mg/kg	0.1	**0.5**	**7.1**	**2.5**	**0.1**
Benzo(a)anthracene	mg/kg	0.1	**0.4**	**3.7**	**1.2**	<0.1
Chrysene	mg/kg	0.1	**0.4**	**3.6**	**1.1**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.5**	**4.6**	**1.0**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.4**	**2.3**	**0.9**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.5**	**4.0**	**1.3**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.5**	**2.7**	**0.7**	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	**0.4**	**0.1**	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.5**	**2.3**	**0.6**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	**0.7**	**5.8**	**1.8**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	**0.8**	**5.8**	**1.8**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	**0.7**	**5.8**	**1.8**	<0.2
Total PAH	mg/kg	0.8	**4.4**	**49**	**15**	<0.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.001 Soil 02 Mar 2015 BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		**110**	**82**	**84**	**86**
2-fluorobiphenyl (Surrogate)	%	-		**80**	**82**	**82**	**82**
d14-p-terphenyl (Surrogate)	%	-		**94**	**94**	**94**	**112**
OC Pesticides in Soil Method: AN400/AN420							
Hexachlorobenzene (HCB)	mg/kg	0.1		<0.1	<0.1	-	<0.1
Alpha BHC	mg/kg	0.1		<0.1	<0.1	-	<0.1
Lindane	mg/kg	0.1		<0.1	<0.1	-	<0.1
Heptachlor	mg/kg	0.1		<0.1	<0.1	-	<0.1
Aldrin	mg/kg	0.1		<0.1	<0.1	-	<0.1
Beta BHC	mg/kg	0.1		<0.1	<0.1	-	<0.1
Delta BHC	mg/kg	0.1		<0.1	<0.1	-	<0.1
Heptachlor epoxide	mg/kg	0.1		<0.1	<0.1	-	<0.1
o,p'-DDE	mg/kg	0.1		<0.1	<0.1	-	<0.1
Alpha Endosulfan	mg/kg	0.2		<0.2	<0.2	-	<0.2
Gamma Chlordane	mg/kg	0.1		<0.1	<0.1	-	<0.1
Alpha Chlordane	mg/kg	0.1		<0.1	<0.1	-	<0.1
trans-Nonachlor	mg/kg	0.1		<0.1	<0.1	-	<0.1
p,p'-DDE	mg/kg	0.1		<0.1	<0.1	-	<0.1
Dieldrin	mg/kg	0.2		<0.2	<0.2	-	<0.2
Endrin	mg/kg	0.2		<0.2	<0.2	-	<0.2
o,p'-DDD	mg/kg	0.1		<0.1	<0.1	-	<0.1
o,p'-DDT	mg/kg	0.1		<0.1	<0.1	-	<0.1
Beta Endosulfan	mg/kg	0.2		<0.2	<0.2	-	<0.2
p,p'-DDD	mg/kg	0.1		<0.1	<0.1	-	<0.1
p,p'-DDT	mg/kg	0.1		<0.1	<0.1	-	<0.1
Endosulfan sulphate	mg/kg	0.1		<0.1	<0.1	-	<0.1
Endrin Aldehyde	mg/kg	0.1		<0.1	<0.1	-	<0.1
Methoxychlor	mg/kg	0.1		<0.1	<0.1	-	<0.1
Endrin Ketone	mg/kg	0.1		<0.1	<0.1	-	<0.1
Isodrin	mg/kg	0.1		<0.1	<0.1	-	<0.1
Mirex	mg/kg	0.1		<0.1	<0.1	-	<0.1

Parameter	Units	LOR	Sample Number: SE136783.001 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
OC Pesticides in Soil Method: AN400/AN420 (continued)						
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**101**	**107**	-	**111**
OP Pesticides in Soil Method: AN400/AN420						
Dichlorvos	mg/kg	0.5	<0.5	<0.5	-	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	-	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	-	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	-	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	-	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	-	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	-	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	<0.2
Surrogates						
2-fluorobiphenyl (Surrogate)	%	-	**80**	**82**	-	**82**
d14-p-terphenyl (Surrogate)	%	-	**94**	**94**	-	**112**
PCBs in Soil Method: AN400/AN420						
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	<1

Parameter	Units	LOR	Sample Number: SE136783.001 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
PCBs in Soil Method: AN400/AN420 (continued)						
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**101**	**107**	-	**111**
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320						
Arsenic, As	mg/kg	3	**6**	**6**	<3	<3
Cadmium, Cd	mg/kg	0.3	**1.1**	**1.8**	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	**7.7**	**8.4**	**4.7**	**6.9**
Copper, Cu	mg/kg	0.5	**120**	**89**	**5.2**	**68**
Lead, Pb	mg/kg	1	**230**	**220**	**14**	**17**
Nickel, Ni	mg/kg	0.5	**15**	**9.7**	**0.7**	**7.1**
Zinc, Zn	mg/kg	0.5	**330**	**480**	**49**	**33**
Mercury in Soil Method: AN312						
Mercury	mg/kg	0.01	**0.37**	**0.10**	**0.01**	**0.04**
Moisture Content Method: AN002						
% Moisture	%	0.5	**14**	**12**	**4.7**	**13**
Fibre Identification in soil Method: AN602						
FibreID						
Asbestos Detected	No unit	-	No	No	-	No
SemiQuant						
Estimated Fibres	%w/w	0.01	<0.01	<0.01	-	<0.01
VOCs in Water Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	-	-	-	-
Toluene	µg/L	0.5	-	-	-	-
Ethylbenzene	µg/L	0.5	-	-	-	-
m/p-xylene	µg/L	1	-	-	-	-
o-xylene	µg/L	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number: SE136783.001 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
VOCs in Water Method: AN433/AN434 (continued)						
Polycyclic VOCs						
Naphthalene	µg/L	0.5	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
Totals						
Total Xylenes	µg/L	1.5	-	-	-	-
Total BTEX	µg/L	3	-	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410						
TRH C6-C10	µg/L	50	-	-	-	-
TRH C6-C9	µg/L	40	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
VPH F Bands						
Benzene (F0)	µg/L	0.5	-	-	-	-
TRH C6-C10 minus BTEX (F1)	µg/L	50	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403						
TRH C10-C14	µg/L	50	-	-	-	-
TRH C15-C28	µg/L	200	-	-	-	-
TRH C29-C36	µg/L	200	-	-	-	-
TRH C37-C40	µg/L	200	-	-	-	-
TRH C10-C36	µg/L	450	-	-	-	-
TRH C10-C40	µg/L	650	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.001 Soil 02 Mar 2015 BH1_0.2-0.4	SE136783.002 Soil 02 Mar 2015 BH2_0.2-0.4	SE136783.003 Soil 02 Mar 2015 BH2_0.6-0.8	SE136783.004 Soil 02 Mar 2015 BH3_0.2-0.4
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 (continued)							
TRH F Bands							
TRH >C10-C16 (F2)	µg/L	60		-	-	-	-
TRH >C16-C34 (F3)	µg/L	500		-	-	-	-
TRH >C34-C40 (F4)	µg/L	500		-	-	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318							
Arsenic, As	µg/L	1		-	-	-	-
Cadmium, Cd	µg/L	0.1		-	-	-	-
Chromium, Cr	µg/L	1		-	-	-	-
Copper, Cu	µg/L	1		-	-	-	-
Lead, Pb	µg/L	1		-	-	-	-
Nickel, Ni	µg/L	1		-	-	-	-
Zinc, Zn	µg/L	5		-	-	-	-
Mercury (dissolved) in Water Method: AN311/AN312							
Mercury	mg/L	0.0001		-	-	-	-

Parameter	Units	LOR	Sample Number: SE136783.005 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
VOC's in Soil Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	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
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**79**	**83**	**84**	**85**
d4-1,2-dichloroethane (Surrogate)	%	-	**92**	**95**	**96**	**96**
d8-toluene (Surrogate)	%	-	**88**	**90**	**92**	**93**
Bromofluorobenzene (Surrogate)	%	-	**86**	**92**	**88**	**90**
Totals						
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**79**	**83**	**84**	**85**
d4-1,2-dichloroethane (Surrogate)	%	-	**92**	**95**	**96**	**96**
d8-toluene (Surrogate)	%	-	**88**	**90**	**92**	**93**
Bromofluorobenzene (Surrogate)	%	-	**86**	**92**	**88**	**90**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.005 Soil 02 Mar 2015 BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)							
VPH F Bands							
Benzene (F0)	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25		<25	<25	<25	<25
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403							
TRH C10-C14	mg/kg	20		<20	<20	<20	<20
TRH C15-C28	mg/kg	45		<45	<45	**47**	<45
TRH C29-C36	mg/kg	45		<45	<45	<45	<45
TRH C37-C40	mg/kg	100		<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110		<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210		<210	<210	<210	<210
TRH F Bands							
TRH >C10-C16 (F2)	mg/kg	25		<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25		<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90		<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120		<120	<120	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420							
Naphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1		<0.1	<0.1	**0.2**	<0.1
Acenaphthene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1		<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1		<0.1	**0.3**	**1.0**	<0.1
Anthracene	mg/kg	0.1		<0.1	<0.1	**0.2**	<0.1
Fluoranthene	mg/kg	0.1		<0.1	**0.7**	**1.8**	<0.1
Pyrene	mg/kg	0.1		<0.1	**0.7**	**1.9**	<0.1
Benzo(a)anthracene	mg/kg	0.1		<0.1	**0.4**	**1.5**	<0.1
Chrysene	mg/kg	0.1		<0.1	**0.4**	**1.2**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1		<0.1	**0.5**	**1.1**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1		<0.1	**0.4**	**0.8**	<0.1
Benzo(a)pyrene	mg/kg	0.1		<0.1	**0.6**	**1.3**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	**0.2**	**0.6**	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1		<0.1	<0.1	**0.1**	<0.1
Benzo(ghi)perylene	mg/kg	0.1		<0.1	**0.2**	**0.5**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2		<0.2	**0.8**	**1.8**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3		<0.3	**0.9**	**1.8**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2		<0.2	**0.8**	**1.8**	<0.2
Total PAH	mg/kg	0.8		<0.8	**4.5**	**12**	<0.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.005 Soil 02 Mar 2015 BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		**86**	**86**	**82**	**84**
2-fluorobiphenyl (Surrogate)	%	-		**80**	**80**	**82**	**80**
d14-p-terphenyl (Surrogate)	%	-		**96**	**92**	**94**	**94**
OC Pesticides in Soil Method: AN400/AN420							
Hexachlorobenzene (HCB)	mg/kg	0.1		<0.1	<0.1	-	-
Alpha BHC	mg/kg	0.1		<0.1	<0.1	-	-
Lindane	mg/kg	0.1		<0.1	<0.1	-	-
Heptachlor	mg/kg	0.1		<0.1	<0.1	-	-
Aldrin	mg/kg	0.1		<0.1	<0.1	-	-
Beta BHC	mg/kg	0.1		<0.1	<0.1	-	-
Delta BHC	mg/kg	0.1		<0.1	<0.1	-	-
Heptachlor epoxide	mg/kg	0.1		<0.1	<0.1	-	-
o,p'-DDE	mg/kg	0.1		<0.1	<0.1	-	-
Alpha Endosulfan	mg/kg	0.2		<0.2	<0.2	-	-
Gamma Chlordane	mg/kg	0.1		<0.1	<0.1	-	-
Alpha Chlordane	mg/kg	0.1		<0.1	<0.1	-	-
trans-Nonachlor	mg/kg	0.1		<0.1	<0.1	-	-
p,p'-DDE	mg/kg	0.1		<0.1	<0.1	-	-
Dieldrin	mg/kg	0.2		<0.2	<0.2	-	-
Endrin	mg/kg	0.2		<0.2	<0.2	-	-
o,p'-DDD	mg/kg	0.1		<0.1	<0.1	-	-
o,p'-DDT	mg/kg	0.1		<0.1	<0.1	-	-
Beta Endosulfan	mg/kg	0.2		<0.2	<0.2	-	-
p,p'-DDD	mg/kg	0.1		<0.1	<0.1	-	-
p,p'-DDT	mg/kg	0.1		<0.1	<0.1	-	-
Endosulfan sulphate	mg/kg	0.1		<0.1	<0.1	-	-
Endrin Aldehyde	mg/kg	0.1		<0.1	<0.1	-	-
Methoxychlor	mg/kg	0.1		<0.1	<0.1	-	-
Endrin Ketone	mg/kg	0.1		<0.1	<0.1	-	-
Isodrin	mg/kg	0.1		<0.1	<0.1	-	-
Mirex	mg/kg	0.1		<0.1	<0.1	-	-

Parameter	Units	LOR	Sample Number: SE136783.005 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
OC Pesticides in Soil Method: AN400/AN420 (continued)						
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**117**	**109**	-	-
OP Pesticides in Soil Method: AN400/AN420						
Dichlorvos	mg/kg	0.5	<0.5	<0.5	-	-
Dimethoate	mg/kg	0.5	<0.5	<0.5	-	-
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	-	-
Fenitrothion	mg/kg	0.2	<0.2	<0.2	-	-
Malathion	mg/kg	0.2	<0.2	<0.2	-	-
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	-	-
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	-	-
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	-	-
Methidathion	mg/kg	0.5	<0.5	<0.5	-	-
Ethion	mg/kg	0.2	<0.2	<0.2	-	-
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	-	-
Surrogates						
2-fluorobiphenyl (Surrogate)	%	-	**80**	**80**	-	-
d14-p-terphenyl (Surrogate)	%	-	**96**	**92**	-	-
PCBs in Soil Method: AN400/AN420						
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-

Parameter	Units	LOR	Sample Number: SE136783.005 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
PCBs in Soil Method: AN400/AN420 (continued)						
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**117**	**109**	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320						
Arsenic, As	mg/kg	3	<3	**39**	**29**	<3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	**0.4**	<0.3
Chromium, Cr	mg/kg	0.3	**14**	**8.8**	**14**	**4.6**
Copper, Cu	mg/kg	0.5	**85**	**37**	**79**	**2.9**
Lead, Pb	mg/kg	1	**2**	**32**	**34**	**4**
Nickel, Ni	mg/kg	0.5	**7.0**	**1.1**	**9.6**	<0.5
Zinc, Zn	mg/kg	0.5	**7.7**	**29**	**230**	**6.0**
Mercury in Soil Method: AN312						
Mercury	mg/kg	0.01	<0.01	**0.16**	**0.16**	**0.01**
Moisture Content Method: AN002						
% Moisture	%	0.5	**14**	**12**	**12**	**9.1**
Fibre Identification in soil Method: AN602						
FibreID						
Asbestos Detected	No unit	-	No	No	-	-
SemiQuant						
Estimated Fibres	%w/w	0.01	<0.01	<0.01	-	-
VOCs in Water Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	-	-	-	-
Toluene	µg/L	0.5	-	-	-	-
Ethylbenzene	µg/L	0.5	-	-	-	-
m/p-xylene	µg/L	1	-	-	-	-
o-xylene	µg/L	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number: SE136783.005 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
VOCs in Water Method: AN433/AN434 (continued)						
Polycyclic VOCs						
Naphthalene	µg/L	0.5	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
Totals						
Total Xylenes	µg/L	1.5	-	-	-	-
Total BTEX	µg/L	3	-	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410						
TRH C6-C10	µg/L	50	-	-	-	-
TRH C6-C9	µg/L	40	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
VPH F Bands						
Benzene (F0)	µg/L	0.5	-	-	-	-
TRH C6-C10 minus BTEX (F1)	µg/L	50	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403						
TRH C10-C14	µg/L	50	-	-	-	-
TRH C15-C28	µg/L	200	-	-	-	-
TRH C29-C36	µg/L	200	-	-	-	-
TRH C37-C40	µg/L	200	-	-	-	-
TRH C10-C36	µg/L	450	-	-	-	-
TRH C10-C40	µg/L	650	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.005 Soil 02 Mar 2015 BH4_0.2-0.4	SE136783.006 Soil 02 Mar 2015 BH5_0.2-0.4	SE136783.007 Soil 02 Mar 2015 BH5_0.6-0.8	SE136783.008 Soil 02 Mar 2015 BH5_1.3-1.5
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 (continued)							
TRH F Bands							
TRH >C10-C16 (F2)	µg/L	60		-	-	-	-
TRH >C16-C34 (F3)	µg/L	500		-	-	-	-
TRH >C34-C40 (F4)	µg/L	500		-	-	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318							
Arsenic, As	µg/L	1		-	-	-	-
Cadmium, Cd	µg/L	0.1		-	-	-	-
Chromium, Cr	µg/L	1		-	-	-	-
Copper, Cu	µg/L	1		-	-	-	-
Lead, Pb	µg/L	1		-	-	-	-
Nickel, Ni	µg/L	1		-	-	-	-
Zinc, Zn	µg/L	5		-	-	-	-
Mercury (dissolved) in Water Method: AN311/AN312							
Mercury	mg/L	0.0001		-	-	-	-

Parameter	Units	LOR	Sample Number: SE136783.009 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
VOC's in Soil Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	**0.1**	<0.1	**0.2**
Ethylbenzene	mg/kg	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
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**83**	**82**	**80**	**80**
d4-1,2-dichloroethane (Surrogate)	%	-	**94**	**95**	**94**	**92**
d8-toluene (Surrogate)	%	-	**91**	**89**	**92**	**88**
Bromofluorobenzene (Surrogate)	%	-	**87**	**83**	**85**	**83**
Totals						
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**83**	**82**	**80**	**80**
d4-1,2-dichloroethane (Surrogate)	%	-	**94**	**95**	**94**	**92**
d8-toluene (Surrogate)	%	-	**91**	**89**	**92**	**88**
Bromofluorobenzene (Surrogate)	%	-	**87**	**83**	**85**	**83**

Parameter	Units	LOR	Sample Number: SE136783.009 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)						
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403						
TRH C10-C14	mg/kg	20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**81**	**120**	<45	**310**
TRH C29-C36	mg/kg	45	**91**	**100**	<45	**220**
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	**170**	**220**	<110	**520**
TRH C10-C40 Total	mg/kg	210	<210	**220**	<210	**520**
TRH F Bands						
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**160**	**210**	<90	**470**
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420						
Naphthalene	mg/kg	0.1	<0.1	**0.2**	<0.1	-
2-methylnaphthalene	mg/kg	0.1	<0.1	**0.2**	<0.1	-
1-methylnaphthalene	mg/kg	0.1	<0.1	**0.4**	<0.1	-
Acenaphthylene	mg/kg	0.1	**0.2**	**0.3**	<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	**0.7**	**1.7**	<0.1	-
Anthracene	mg/kg	0.1	**0.2**	**0.5**	<0.1	-
Fluoranthene	mg/kg	0.1	**1.3**	**4.2**	<0.1	-
Pyrene	mg/kg	0.1	**1.3**	**4.1**	<0.1	-
Benzo(a)anthracene	mg/kg	0.1	**0.7**	**2.4**	<0.1	-
Chrysene	mg/kg	0.1	**0.8**	**2.3**	<0.1	-
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.9**	**2.6**	<0.1	-
Benzo(k)fluoranthene	mg/kg	0.1	**0.6**	**2.0**	<0.1	-
Benzo(a)pyrene	mg/kg	0.1	**0.9**	**3.0**	<0.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.6**	**1.8**	<0.1	-
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	**0.2**	<0.1	-
Benzo(ghi)perylene	mg/kg	0.1	**0.7**	**1.6**	<0.1	-
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	**1.2**	**4.1**	<0.2	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	**1.3**	**4.1**	<0.3	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	**1.3**	**4.1**	<0.2	-
Total PAH	mg/kg	0.8	**8.8**	**28**	<0.8	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.009 Soil 02 Mar 2015 BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		**80**	**86**	**82**	-
2-fluorobiphenyl (Surrogate)	%	-		**82**	**78**	**96**	-
d14-p-terphenyl (Surrogate)	%	-		**92**	**92**	**88**	-
OC Pesticides in Soil Method: AN400/AN420							
Hexachlorobenzene (HCB)	mg/kg	0.1		<0.1	<0.1	<0.1	-
Alpha BHC	mg/kg	0.1		<0.1	<0.1	<0.1	-
Lindane	mg/kg	0.1		<0.1	<0.1	<0.1	-
Heptachlor	mg/kg	0.1		<0.1	<0.1	<0.1	-
Aldrin	mg/kg	0.1		<0.1	<0.1	<0.1	-
Beta BHC	mg/kg	0.1		<0.1	<0.1	<0.1	-
Delta BHC	mg/kg	0.1		<0.1	<0.1	<0.1	-
Heptachlor epoxide	mg/kg	0.1		<0.1	<0.1	<0.1	-
o,p'-DDE	mg/kg	0.1		<0.1	<0.1	<0.1	-
Alpha Endosulfan	mg/kg	0.2		<0.2	<0.2	<0.2	-
Gamma Chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	-
Alpha Chlordane	mg/kg	0.1		<0.1	<0.1	<0.1	-
trans-Nonachlor	mg/kg	0.1		<0.1	<0.1	<0.1	-
p,p'-DDE	mg/kg	0.1		<0.1	<0.1	<0.1	-
Dieldrin	mg/kg	0.2		<0.2	<0.2	<0.2	-
Endrin	mg/kg	0.2		<0.2	<0.2	<0.2	-
o,p'-DDD	mg/kg	0.1		<0.1	<0.1	<0.1	-
o,p'-DDT	mg/kg	0.1		<0.1	<0.1	<0.1	-
Beta Endosulfan	mg/kg	0.2		<0.2	<0.2	<0.2	-
p,p'-DDD	mg/kg	0.1		<0.1	<0.1	<0.1	-
p,p'-DDT	mg/kg	0.1		<0.1	<0.1	<0.1	-
Endosulfan sulphate	mg/kg	0.1		<0.1	<0.1	<0.1	-
Endrin Aldehyde	mg/kg	0.1		<0.1	<0.1	<0.1	-
Methoxychlor	mg/kg	0.1		<0.1	<0.1	<0.1	-
Endrin Ketone	mg/kg	0.1		<0.1	<0.1	<0.1	-
Isodrin	mg/kg	0.1		<0.1	<0.1	<0.1	-
Mirex	mg/kg	0.1		<0.1	<0.1	<0.1	-

Parameter	Units	LOR	Sample Number: SE136783.009 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
OC Pesticides in Soil Method: AN400/AN420 (continued)						
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**110**	**112**	**113**	-
OP Pesticides in Soil Method: AN400/AN420						
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	-
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	-
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	-
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	-
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	-
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	-
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	-
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	-
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	-
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	-
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	-
Surrogates						
2-fluorobiphenyl (Surrogate)	%	-	**82**	**78**	**96**	-
d14-p-terphenyl (Surrogate)	%	-	**92**	**92**	**88**	-
PCBs in Soil Method: AN400/AN420						
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	-
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	-
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	-

Parameter	Units	LOR	Sample Number: SE136783.009 Sample Matrix: Soil Sample Date: 02 Mar 2015 Sample Name: BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
PCBs in Soil Method: AN400/AN420 (continued)						
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**110**	**112**	**113**	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320						
Arsenic, As	mg/kg	3	**8**	**9**	<3	**59**
Cadmium, Cd	mg/kg	0.3	**0.4**	**0.5**	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	**10**	**7.7**	**1.7**	**10**
Copper, Cu	mg/kg	0.5	**33**	**30**	**28**	**29**
Lead, Pb	mg/kg	1	**100**	**110**	**2**	**720**
Nickel, Ni	mg/kg	0.5	**4.0**	**3.7**	**2.5**	**7.3**
Zinc, Zn	mg/kg	0.5	**180**	**140**	**5.6**	**76**
Mercury in Soil Method: AN312						
Mercury	mg/kg	0.01	**0.24**	**0.51**	<0.01	**0.82**
Moisture Content Method: AN002						
% Moisture	%	0.5	**12**	**13**	**16**	**15**
Fibre Identification in soil Method: AN602						
FibreID						
Asbestos Detected	No unit	-	No	No	No	-
SemiQuant						
Estimated Fibres	%w/w	0.01	<0.01	<0.01	<0.01	-
VOCs in Water Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5	-	-	-	-
Toluene	µg/L	0.5	-	-	-	-
Ethylbenzene	µg/L	0.5	-	-	-	-
m/p-xylene	µg/L	1	-	-	-	-
o-xylene	µg/L	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE136783.009 Soil 02 Mar 2015 BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
VOCs in Water Method: AN433/AN434 (continued)						
Polycyclic VOCs						
Naphthalene	µg/L	0.5	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
Totals						
Total Xylenes	µg/L	1.5	-	-	-	-
Total BTEX	µg/L	3	-	-	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410						
TRH C6-C10	µg/L	50	-	-	-	-
TRH C6-C9	µg/L	40	-	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-
d8-toluene (Surrogate)	%	-	-	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-	-	-
VPH F Bands						
Benzene (F0)	µg/L	0.5	-	-	-	-
TRH C6-C10 minus BTEX (F1)	µg/L	50	-	-	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403						
TRH C10-C14	µg/L	50	-	-	-	-
TRH C15-C28	µg/L	200	-	-	-	-
TRH C29-C36	µg/L	200	-	-	-	-
TRH C37-C40	µg/L	200	-	-	-	-
TRH C10-C36	µg/L	450	-	-	-	-
TRH C10-C40	µg/L	650	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.009 Soil 02 Mar 2015 BH6_0.2-0.4	SE136783.010 Soil 02 Mar 2015 BH6_0.5-0.7	SE136783.011 Soil 02 Mar 2015 BH7_0.15-0.3	SE136783.012 Soil 02 Mar 2015 QD1
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 (continued)							
TRH F Bands							
TRH >C10-C16 (F2)	µg/L	60		-	-	-	-
TRH >C16-C34 (F3)	µg/L	500		-	-	-	-
TRH >C34-C40 (F4)	µg/L	500		-	-	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318							
Arsenic, As	µg/L	1		-	-	-	-
Cadmium, Cd	µg/L	0.1		-	-	-	-
Chromium, Cr	µg/L	1		-	-	-	-
Copper, Cu	µg/L	1		-	-	-	-
Lead, Pb	µg/L	1		-	-	-	-
Nickel, Ni	µg/L	1		-	-	-	-
Zinc, Zn	µg/L	5		-	-	-	-
Mercury (dissolved) in Water Method: AN311/AN312							
Mercury	mg/L	0.0001		-	-	-	-

Parameter	Units	LOR	Sample Number: SE136783.013 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: TB1	Sample Number: SE136783.014 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: RB1
VOC's in Soil Method: AN433/AN434				
Monocyclic Aromatic Hydrocarbons				
Benzene	mg/kg	0.1	-	-
Toluene	mg/kg	0.1	-	-
Ethylbenzene	mg/kg	0.1	-	-
m/p-xylene	mg/kg	0.2	-	-
o-xylene	mg/kg	0.1	-	-
Polycyclic VOCs				
Naphthalene	mg/kg	0.1	-	-
Surrogates				
Dibromofluoromethane (Surrogate)	%	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-
d8-toluene (Surrogate)	%	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-
Totals				
Total Xylenes*	mg/kg	0.3	-	-
Total BTEX*	mg/kg	0.6	-	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410				
TRH C6-C10	mg/kg	25	-	-
TRH C6-C9	mg/kg	20	-	-
Surrogates				
Dibromofluoromethane (Surrogate)	%	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-	-
d8-toluene (Surrogate)	%	-	-	-
Bromofluorobenzene (Surrogate)	%	-	-	-

Parameter	Units	LOR	Sample Number: SE136783.013 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: TB1	Sample Number: SE136783.014 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: RB1
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)				
VPH F Bands				
Benzene (F0)	mg/kg	0.1	-	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403				
TRH C10-C14	mg/kg	20	-	-
TRH C15-C28	mg/kg	45	-	-
TRH C29-C36	mg/kg	45	-	-
TRH C37-C40	mg/kg	100	-	-
TRH C10-C36 Total	mg/kg	110	-	-
TRH C10-C40 Total	mg/kg	210	-	-
TRH F Bands				
TRH >C10-C16 (F2)	mg/kg	25	-	-
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	-	-
TRH >C16-C34 (F3)	mg/kg	90	-	-
TRH >C34-C40 (F4)	mg/kg	120	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420				
Naphthalene	mg/kg	0.1	-	-
2-methylnaphthalene	mg/kg	0.1	-	-
1-methylnaphthalene	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)fluoranthene	mg/kg	0.1	-	-
Benzo(k)fluoranthene	mg/kg	0.1	-	-
Benzo(a)pyrene	mg/kg	0.1	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-
Benzo(ghi)perylene	mg/kg	0.1	-	-
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	-	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	-	-
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	-	-
Total PAH	mg/kg	0.8	-	-

Parameter	Units	LOR	Sample Number: SE136783.013 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: TB1	Sample Number: SE136783.014 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: RB1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)				
Surrogates				
d5-nitrobenzene (Surrogate)	%	-	-	-
2-fluorobiphenyl (Surrogate)	%	-	-	-
d14-p-terphenyl (Surrogate)	%	-	-	-
OC Pesticides in Soil Method: AN400/AN420				
Hexachlorobenzene (HCB)	mg/kg	0.1	-	-
Alpha BHC	mg/kg	0.1	-	-
Lindane	mg/kg	0.1	-	-
Heptachlor	mg/kg	0.1	-	-
Aldrin	mg/kg	0.1	-	-
Beta BHC	mg/kg	0.1	-	-
Delta BHC	mg/kg	0.1	-	-
Heptachlor epoxide	mg/kg	0.1	-	-
o,p'-DDE	mg/kg	0.1	-	-
Alpha Endosulfan	mg/kg	0.2	-	-
Gamma Chlordane	mg/kg	0.1	-	-
Alpha Chlordane	mg/kg	0.1	-	-
trans-Nonachlor	mg/kg	0.1	-	-
p,p'-DDE	mg/kg	0.1	-	-
Dieldrin	mg/kg	0.2	-	-
Endrin	mg/kg	0.2	-	-
o,p'-DDD	mg/kg	0.1	-	-
o,p'-DDT	mg/kg	0.1	-	-
Beta Endosulfan	mg/kg	0.2	-	-
p,p'-DDD	mg/kg	0.1	-	-
p,p'-DDT	mg/kg	0.1	-	-
Endosulfan sulphate	mg/kg	0.1	-	-
Endrin Aldehyde	mg/kg	0.1	-	-
Methoxychlor	mg/kg	0.1	-	-
Endrin Ketone	mg/kg	0.1	-	-
Isodrin	mg/kg	0.1	-	-
Mirex	mg/kg	0.1	-	-

Parameter	Units	LOR	Sample Number: SE136783.013 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: TB1	Sample Number: SE136783.014 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: RB1
OC Pesticides in Soil Method: AN400/AN420 (continued)				
Surrogates				
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	-
OP Pesticides in Soil Method: AN400/AN420				
Dichlorvos	mg/kg	0.5	-	-
Dimethoate	mg/kg	0.5	-	-
Diazinon (Dimpylate)	mg/kg	0.5	-	-
Fenitrothion	mg/kg	0.2	-	-
Malathion	mg/kg	0.2	-	-
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	-	-
Parathion-ethyl (Parathion)	mg/kg	0.2	-	-
Bromophos Ethyl	mg/kg	0.2	-	-
Methidathion	mg/kg	0.5	-	-
Ethion	mg/kg	0.2	-	-
Azinphos-methyl (Guthion)	mg/kg	0.2	-	-
Surrogates				
2-fluorobiphenyl (Surrogate)	%	-	-	-
d14-p-terphenyl (Surrogate)	%	-	-	-
PCBs in Soil Method: AN400/AN420				
Arochlor 1016	mg/kg	0.2	-	-
Arochlor 1221	mg/kg	0.2	-	-
Arochlor 1232	mg/kg	0.2	-	-
Arochlor 1242	mg/kg	0.2	-	-
Arochlor 1248	mg/kg	0.2	-	-
Arochlor 1254	mg/kg	0.2	-	-
Arochlor 1260	mg/kg	0.2	-	-
Arochlor 1262	mg/kg	0.2	-	-
Arochlor 1268	mg/kg	0.2	-	-
Total PCBs (Arochlors)	mg/kg	1	-	-

Parameter	Units	LOR	Sample Number: SE136783.013 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: TB1	Sample Number: SE136783.014 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: RB1
PCBs in Soil Method: AN400/AN420 (continued)				
Surrogates				
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320				
Arsenic, As	mg/kg	3	-	-
Cadmium, Cd	mg/kg	0.3	-	-
Chromium, Cr	mg/kg	0.3	-	-
Copper, Cu	mg/kg	0.5	-	-
Lead, Pb	mg/kg	1	-	-
Nickel, Ni	mg/kg	0.5	-	-
Zinc, Zn	mg/kg	0.5	-	-
Mercury in Soil Method: AN312				
Mercury	mg/kg	0.01	-	-
Moisture Content Method: AN002				
% Moisture	%	0.5	-	-
Fibre Identification in soil Method: AN602				
FibreID				
Asbestos Detected	No unit	-	-	-
SemiQuant				
Estimated Fibres	%w/w	0.01	-	-
VOCs in Water Method: AN433/AN434				
Monocyclic Aromatic Hydrocarbons				
Benzene	µg/L	0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5

Parameter	Units	LOR	Sample Number: SE136783.013 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: TB1	Sample Number: SE136783.014 Sample Matrix: Water Sample Date: 02 Mar 2015 Sample Name: RB1
VOCs in Water Method: AN433/AN434 (continued)				
Polycyclic VOCs				
Naphthalene	µg/L	0.5	<0.5	<0.5
Surrogates				
Dibromofluoromethane (Surrogate)	%	-	**108**	**106**
d4-1,2-dichloroethane (Surrogate)	%	-	**111**	**107**
d8-toluene (Surrogate)	%	-	**97**	**94**
Bromofluorobenzene (Surrogate)	%	-	**89**	**88**
Totals				
Total Xylenes	µg/L	1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410				
TRH C6-C10	µg/L	50	-	<50
TRH C6-C9	µg/L	40	-	<40
Surrogates				
Dibromofluoromethane (Surrogate)	%	-	-	**106**
d4-1,2-dichloroethane (Surrogate)	%	-	-	**107**
d8-toluene (Surrogate)	%	-	-	**94**
Bromofluorobenzene (Surrogate)	%	-	-	**88**
VPH F Bands				
Benzene (F0)	µg/L	0.5	-	<0.5
TRH C6-C10 minus BTEX (F1)	µg/L	50	-	<50

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE136783.013 Water 02 Mar 2015 TB1	SE136783.014 Water 02 Mar 2015 RB1
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403					
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-C36	µg/L	450		-	<450
TRH C10-C40	µg/L	650		-	<650
TRH F Bands					
TRH >C10-C16 (F2)	µg/L	60		-	<60
TRH >C16-C34 (F3)	µg/L	500		-	<500
TRH >C34-C40 (F4)	µg/L	500		-	<500
Trace Metals (Dissolved) in Water by ICPMS Method: AN318					
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		-	**79**
Mercury (dissolved) in Water Method: AN311/AN312					
Mercury	mg/L	0.0001		-	<0.0001

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311/AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB073294	mg/L	0.0001	<0.0001	0%	104%	106%

Mercury in Soil Method: ME-(AU)-[ENV]AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB073148	mg/kg	0.01	<0.01	0 - 14%	120%	90%

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

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB073187	%	0.5	1 - 8%

OC Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Hexachlorobenzene (HCB)	LB073161	mg/kg	0.1	<0.1	0%	NA
Alpha BHC	LB073161	mg/kg	0.1	<0.1	0%	NA
Lindane	LB073161	mg/kg	0.1	<0.1	0%	NA
Heptachlor	LB073161	mg/kg	0.1	<0.1	0%	110%
Aldrin	LB073161	mg/kg	0.1	<0.1	0%	107%
Beta BHC	LB073161	mg/kg	0.1	<0.1	0%	NA
Delta BHC	LB073161	mg/kg	0.1	<0.1	0%	103%
Heptachlor epoxide	LB073161	mg/kg	0.1	<0.1	0%	NA
o,p'-DDE	LB073161	mg/kg	0.1	<0.1	0%	NA
Alpha Endosulfan	LB073161	mg/kg	0.2	<0.2	0%	NA
Gamma Chlordane	LB073161	mg/kg	0.1	<0.1	0%	NA
Alpha Chlordane	LB073161	mg/kg	0.1	<0.1	0%	NA
trans-Nonachlor	LB073161	mg/kg	0.1	<0.1	0%	NA
p,p'-DDE	LB073161	mg/kg	0.1	<0.1	0%	NA
Dieldrin	LB073161	mg/kg	0.2	<0.2	0%	104%
Endrin	LB073161	mg/kg	0.2	<0.2	0%	111%
o,p'-DDD	LB073161	mg/kg	0.1	<0.1	0%	NA
o,p'-DDT	LB073161	mg/kg	0.1	<0.1	0%	NA
Beta Endosulfan	LB073161	mg/kg	0.2	<0.2	0%	NA
p,p'-DDD	LB073161	mg/kg	0.1	<0.1	0%	NA
p,p'-DDT	LB073161	mg/kg	0.1	<0.1	0%	104%
Endosulfan sulphate	LB073161	mg/kg	0.1	<0.1	0%	NA
Endrin Aldehyde	LB073161	mg/kg	0.1	<0.1	0%	NA
Methoxychlor	LB073161	mg/kg	0.1	<0.1	0%	NA
Endrin Ketone	LB073161	mg/kg	0.1	<0.1	0%	NA
Isodrin	LB073161	mg/kg	0.1	<0.1	0%	NA
Mirex	LB073161	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB073161	%	-	113%	1%	107%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Dichlorvos	LB073161	mg/kg	0.5	<0.5	0%	103%
Dimethoate	LB073161	mg/kg	0.5	<0.5	0%	NA
Diazinon (Dimpylate)	LB073161	mg/kg	0.5	<0.5	0%	94%
Fenitrothion	LB073161	mg/kg	0.2	<0.2	0%	NA
Malathion	LB073161	mg/kg	0.2	<0.2	0%	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB073161	mg/kg	0.2	<0.2	0%	79%
Parathion-ethyl (Parathion)	LB073161	mg/kg	0.2	<0.2	0%	NA
Bromophos Ethyl	LB073161	mg/kg	0.2	<0.2	0%	NA
Methidathion	LB073161	mg/kg	0.5	<0.5	0%	NA
Ethion	LB073161	mg/kg	0.2	<0.2	0%	111%
Azinphos-methyl (Guthion)	LB073161	mg/kg	0.2	<0.2	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
2-fluorobiphenyl (Surrogate)	LB073161	%	-	90%	5%	82%
d14-p-terphenyl (Surrogate)	LB073161	%	-	102%	2%	94%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB073161	mg/kg	0.1	<0.1	22%	106%	115%
2-methylnaphthalene	LB073161	mg/kg	0.1	<0.1	79%	NA	NA
1-methylnaphthalene	LB073161	mg/kg	0.1	<0.1	111%	NA	NA
Acenaphthylene	LB073161	mg/kg	0.1	<0.1	27%	107%	119%
Acenaphthene	LB073161	mg/kg	0.1	<0.1	0%	112%	113%
Fluorene	LB073161	mg/kg	0.1	<0.1	26%	NA	NA
Phenanthrene	LB073161	mg/kg	0.1	<0.1	41%	111%	110%
Anthracene	LB073161	mg/kg	0.1	<0.1	40%	115%	135%
Fluoranthene	LB073161	mg/kg	0.1	<0.1	47%	101%	80%
Pyrene	LB073161	mg/kg	0.1	<0.1	47%	106%	80%
Benzo(a)anthracene	LB073161	mg/kg	0.1	<0.1	44%	NA	NA
Chrysene	LB073161	mg/kg	0.1	<0.1	43%	NA	NA
Benzo(b&j)fluoranthene	LB073161	mg/kg	0.1	<0.1	39%	NA	NA
Benzo(k)fluoranthene	LB073161	mg/kg	0.1	<0.1	44%	NA	NA
Benzo(a)pyrene	LB073161	mg/kg	0.1	<0.1	41%	114%	116%
Indeno(1,2,3-cd)pyrene	LB073161	mg/kg	0.1	<0.1	44%	NA	NA
Dibenzo(a&h)anthracene	LB073161	mg/kg	0.1	<0.1	49%	NA	NA
Benzo(ghi)perylene	LB073161	mg/kg	0.1	<0.1	45%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=0*	LB073161	TEQ	0.2	<0.2	42%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	LB073161	TEQ (mg/kg)	0.3	<0.3	42%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	LB073161	TEQ (mg/kg)	0.2	<0.2	42%	NA	NA
Total PAH	LB073161	mg/kg	0.8	<0.8	45%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB073161	%	-	76%	5%	72%	94%
2-fluorobiphenyl (Surrogate)	LB073161	%	-	78%	5%	74%	90%
d14-p-terphenyl (Surrogate)	LB073161	%	-	98%	2%	78%	104%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arochlor 1016	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1221	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1232	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1242	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1248	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1254	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1260	LB073161	mg/kg	0.2	<0.2	0%	119%
Arochlor 1262	LB073161	mg/kg	0.2	<0.2	0%	NA
Arochlor 1268	LB073161	mg/kg	0.2	<0.2	0%	NA
Total PCBs (Arochlors)	LB073161	mg/kg	1	<1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB073161	%	-	113%	1%	105%

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB073144	mg/kg	3	<3	14 - 15%	100%	106%
Cadmium, Cd	LB073144	mg/kg	0.3	<0.3	0 - 5%	98%	102%
Chromium, Cr	LB073144	mg/kg	0.3	<0.3	1 - 9%	97%	105%
Copper, Cu	LB073144	mg/kg	0.5	<0.5	2 - 13%	99%	111%
Lead, Pb	LB073144	mg/kg	1	<1	2 - 22%	98%	102%
Nickel, Ni	LB073144	mg/kg	0.5	<0.5	7 - 38%	96%	102%
Zinc, Zn	LB073144	mg/kg	0.5	<0.5	5 - 9%	99%	117%

Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arsenic, As	LB073152	µg/L	1	<1	0%	98%
Cadmium, Cd	LB073152	µg/L	0.1	<0.1	0%	101%
Chromium, Cr	LB073152	µg/L	1	<1	0%	101%
Copper, Cu	LB073152	µg/L	1	<1	0%	106%
Lead, Pb	LB073152	µg/L	1	<1	0%	100%
Nickel, Ni	LB073152	µg/L	1	<1	0%	104%
Zinc, Zn	LB073152	µg/L	5	<5	13%	106%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

TRH (Total Recoverable Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN403**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB073161	mg/kg	20	<20	0%	88%	98%
TRH C15-C28	LB073161	mg/kg	45	<45	25%	85%	98%
TRH C29-C36	LB073161	mg/kg	45	<45	21%	78%	78%
TRH C37-C40	LB073161	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB073161	mg/kg	110	<110	23%	NA	NA
TRH C10-C40 Total	LB073161	mg/kg	210	<210	6%	NA	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH >C10-C16 (F2)	LB073161	mg/kg	25	<25	0%	88%	98%
TRH >C10-C16 (F2) - Naphthalene	LB073161	mg/kg	25	<25	0%	NA	NA
TRH >C16-C34 (F3)	LB073161	mg/kg	90	<90	25%	83%	88%
TRH >C34-C40 (F4)	LB073161	mg/kg	120	<120	0%	80%	NA

TRH (Total Recoverable Hydrocarbons) in Water **Method: ME-(AU)-[ENV]AN403**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB073162	µg/L	50	<50	84%
TRH C15-C28	LB073162	µg/L	200	<200	95%
TRH C29-C36	LB073162	µg/L	200	<200	96%
TRH C37-C40	LB073162	µg/L	200	<200	NA
TRH C10-C36	LB073162	µg/L	450	<450	NA
TRH C10-C40	LB073162	µg/L	650	<650	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH >C10-C16 (F2)	LB073162	µg/L	60	<60	89%
TRH >C16-C34 (F3)	LB073162	µg/L	500	<500	99%
TRH >C34-C40 (F4)	LB073162	µg/L	500	<500	94%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

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

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB073167	mg/kg	0.1	<0.1	0%	103%	91%
Toluene	LB073167	mg/kg	0.1	<0.1	10 - 13%	99%	88%
Ethylbenzene	LB073167	mg/kg	0.1	<0.1	0%	83%	93%
m/p-xylene	LB073167	mg/kg	0.2	<0.2	0%	88%	99%
o-xylene	LB073167	mg/kg	0.1	<0.1	0%	88%	99%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB073167	mg/kg	0.1	<0.1	0 - 38%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB073167	%	-	108%	0 - 2%	93%	79%
d4-1,2-dichloroethane (Surrogate)	LB073167	%	-	114%	2 - 3%	100%	89%
d8-toluene (Surrogate)	LB073167	%	-	113%	0 - 2%	101%	87%
Bromofluorobenzene (Surrogate)	LB073167	%	-	110%	2 - 5%	101%	111%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Xylenes*	LB073167	mg/kg	0.3	<0.3	0%	NA	NA
Total BTEX*	LB073167	mg/kg	0.6	<0.6	0%	NA	NA

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

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB073232	µg/L	0.5	<0.5	110%
Toluene	LB073232	µg/L	0.5	<0.5	110%
Ethylbenzene	LB073232	µg/L	0.5	<0.5	108%
m/p-xylene	LB073232	µg/L	1	<1	107%
o-xylene	LB073232	µg/L	0.5	<0.5	108%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Naphthalene	LB073232	µg/L	0.5	<0.5	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB073232	%	-	104%	99%
d4-1,2-dichloroethane (Surrogate)	LB073232	%	-	106%	105%
d8-toluene (Surrogate)	LB073232	%	-	94%	95%
Bromofluorobenzene (Surrogate)	LB073232	%	-	89%	89%

Totals

Parameter	QC Reference	Units	LOR	MB
Total Xylenes	LB073232	µg/L	1.5	<1.5
Total BTEX	LB073232	µg/L	3	<3

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB073167	mg/kg	25	<25	0%	89%	91%
TRH C6-C9	LB073167	mg/kg	20	<20	0%	86%	87%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB073167	%	-	108%	0 - 2%	93%	79%
d4-1,2-dichloroethane (Surrogate)	LB073167	%	-	114%	2 - 3%	100%	89%
d8-toluene (Surrogate)	LB073167	%	-	113%	0 - 2%	101%	87%
Bromofluorobenzene (Surrogate)	LB073167	%	-	110%	2 - 5%	101%	111%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB073167	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB073167	mg/kg	25	<25	0%	84%	82%

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C6-C10	LB073232	µg/L	50	<50	92%
TRH C6-C9	LB073232	µg/L	40	<40	100%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB073232	%	-	104%	99%
d4-1,2-dichloroethane (Surrogate)	LB073232	%	-	106%	105%
d8-toluene (Surrogate)	LB073232	%	-	94%	95%
Bromofluorobenzene (Surrogate)	LB073232	%	-	89%	89%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene (F0)	LB073232	µg/L	0.5	<0.5	NA
TRH C6-C10 minus BTEX (F1)	LB073232	µg/L	50	<50	90%

METHOD SUMMARY

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	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 analsysis by ASS or ICP as per USEPA Method 200.8.
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.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
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 .

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
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, dependant 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	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/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

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
^	Performed by outside laboratory.	NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

STATEMENT OF QA/QC PERFORMANCE

SE136783 R0

CLIENT DETAILS

Contact	Daniel Soliman
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
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Email	Daniel.Soliman@eiaustralia.com.au
Project	**E22390 - 36 Lonsdale Street - Lilyfield**
Order Number	**E22390**
Samples	14

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
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SGS Reference	SE136783 R0
Report Number	0000104336
Date Reported	05 Mar 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	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	15 items
	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	1 item

SAMPLE SUMMARY

Sample counts by matrix	12 Soils & 2 Waters	Type of documentation received	COC
Date documentation received	2/3/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.6°C
Sample container provider	SGS	Turnaround time requested	Three Days
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

SE136783 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
BH1_0.2-0.4	SE136783.001	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073195	02 Mar 2015	02 Mar 2015	01 Mar 2016	04 Mar 2015	01 Mar 2016	05 Mar 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
RB1	SE136783.014	LB073294	02 Mar 2015	02 Mar 2015	30 Mar 2015	05 Mar 2015	30 Mar 2015	05 Mar 2015

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1_0.2-0.4	SE136783.001	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015
QD1	SE136783.012	LB073148	02 Mar 2015	02 Mar 2015	30 Mar 2015	03 Mar 2015	30 Mar 2015	05 Mar 2015

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1_0.2-0.4	SE136783.001	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 2015
QD1	SE136783.012	LB073187	02 Mar 2015	02 Mar 2015	16 Mar 2015	04 Mar 2015	09 Mar 2015	05 Mar 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
BH1_0.2-0.4	SE136783.001	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015

OP Pesticides in Soil

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

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE136783 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.

OP Pesticides in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1_0.2-0.4	SE136783.001	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 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
BH1_0.2-0.4	SE136783.001	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1_0.2-0.4	SE136783.001	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1_0.2-0.4	SE136783.001	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015
QD1	SE136783.012	LB073144	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 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
RB1	SE136783.014	LB073152	02 Mar 2015	02 Mar 2015	29 Aug 2015	03 Mar 2015	29 Aug 2015	05 Mar 2015

HOLDING TIME SUMMARY

SE136783 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.

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
BH1_0.2-0.4	SE136783.001	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073161	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 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
RB1	SE136783.014	LB073162	02 Mar 2015	02 Mar 2015	09 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 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
BH1_0.2-0.4	SE136783.001	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TB1	SE136783.013	LB073232	02 Mar 2015	02 Mar 2015	09 Mar 2015	04 Mar 2015	13 Apr 2015	05 Mar 2015
RB1	SE136783.014	LB073232	02 Mar 2015	02 Mar 2015	09 Mar 2015	04 Mar 2015	13 Apr 2015	05 Mar 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
BH1_0.2-0.4	SE136783.001	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.2-0.4	SE136783.002	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH2_0.6-0.8	SE136783.003	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH3_0.2-0.4	SE136783.004	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH4_0.2-0.4	SE136783.005	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.2-0.4	SE136783.006	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_0.6-0.8	SE136783.007	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH5_1.3-1.5	SE136783.008	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.2-0.4	SE136783.009	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH6_0.5-0.7	SE136783.010	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
BH7_0.15-0.3	SE136783.011	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 2015
QD1	SE136783.012	LB073167	02 Mar 2015	02 Mar 2015	16 Mar 2015	03 Mar 2015	12 Apr 2015	05 Mar 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
TB1	SE136783.013	LB073232	02 Mar 2015	02 Mar 2015	09 Mar 2015	04 Mar 2015	13 Apr 2015	05 Mar 2015
RB1	SE136783.014	LB073232	02 Mar 2015	02 Mar 2015	09 Mar 2015	04 Mar 2015	13 Apr 2015	05 Mar 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)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	101
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	107
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	111
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	117
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	109
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	110
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	112
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	113

OP Pesticides in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	80
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	82
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	82
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	80
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	80
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	82
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	78
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	96
d14-p-terphenyl (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	94
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	94
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	112
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	96
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	92
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	92
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	92
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	88

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1_0.2-0.4	SE136783.001	%	70 - 130%	80
	BH2_0.2-0.4	SE136783.002	%	70 - 130%	82
	BH2_0.6-0.8	SE136783.003	%	70 - 130%	82
	BH3_0.2-0.4	SE136783.004	%	70 - 130%	82
	BH4_0.2-0.4	SE136783.005	%	70 - 130%	80
	BH5_0.2-0.4	SE136783.006	%	70 - 130%	80
	BH5_0.6-0.8	SE136783.007	%	70 - 130%	82
	BH5_1.3-1.5	SE136783.008	%	70 - 130%	80
	BH6_0.2-0.4	SE136783.009	%	70 - 130%	82
	BH6_0.5-0.7	SE136783.010	%	70 - 130%	78
	BH7_0.15-0.3	SE136783.011	%	70 - 130%	96
d14-p-terphenyl (Surrogate)	BH1_0.2-0.4	SE136783.001	%	70 - 130%	94
	BH2_0.2-0.4	SE136783.002	%	70 - 130%	94
	BH2_0.6-0.8	SE136783.003	%	70 - 130%	94
	BH3_0.2-0.4	SE136783.004	%	70 - 130%	112
	BH4_0.2-0.4	SE136783.005	%	70 - 130%	96
	BH5_0.2-0.4	SE136783.006	%	70 - 130%	92
	BH5_0.6-0.8	SE136783.007	%	70 - 130%	94
	BH5_1.3-1.5	SE136783.008	%	70 - 130%	94
	BH6_0.2-0.4	SE136783.009	%	70 - 130%	92
	BH6_0.5-0.7	SE136783.010	%	70 - 130%	92
	BH7_0.15-0.3	SE136783.011	%	70 - 130%	88
d5-nitrobenzene (Surrogate)	BH1_0.2-0.4	SE136783.001	%	70 - 130%	110
	BH2_0.2-0.4	SE136783.002	%	70 - 130%	82
	BH2_0.6-0.8	SE136783.003	%	70 - 130%	84
	BH3_0.2-0.4	SE136783.004	%	70 - 130%	86
	BH4_0.2-0.4	SE136783.005	%	70 - 130%	86
	BH5_0.2-0.4	SE136783.006	%	70 - 130%	86
	BH5_0.6-0.8	SE136783.007	%	70 - 130%	82
	BH5_1.3-1.5	SE136783.008	%	70 - 130%	84
	BH6_0.2-0.4	SE136783.009	%	70 - 130%	80
	BH6_0.5-0.7	SE136783.010	%	70 - 130%	86

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

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

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d5-nitrobenzene (Surrogate)	BH7_0.15-0.3	SE136783.011	%	70 - 130%	82

PCBs in Soil — Method: ME-(AU)-[ENV]AN400/AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	101
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	107
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	111
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	117
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	109
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	110
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	112
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	113

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	95
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	86
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	97
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	92
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	86
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	92
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	88
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	90
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	87
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	83
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	85
	QD1	SE136783.012	%	60 - 130%	83
d4-1,2-dichloroethane (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	101
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	91
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	103
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	99
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	92
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	95
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	96
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	96
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	94
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	95
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	94
	QD1	SE136783.012	%	60 - 130%	92
d8-toluene (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	97
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	90
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	101
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	95
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	88
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	90
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	92
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	93
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	91
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	89
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	92
	QD1	SE136783.012	%	60 - 130%	88
Dibromofluoromethane (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	90
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	83
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	92
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	83
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	79
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	83
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	84
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	85
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	83
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	82
	BH7_0.15-0.3	SE136783.011	%	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.

VOC's in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	QD1	SE136783.012	%	60 - 130%	80

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TB1	SE136783.013	%	40 - 130%	89
	RB1	SE136783.014	%	40 - 130%	88
d4-1,2-dichloroethane (Surrogate)	TB1	SE136783.013	%	40 - 130%	111
	RB1	SE136783.014	%	40 - 130%	107
d8-toluene (Surrogate)	TB1	SE136783.013	%	40 - 130%	97
	RB1	SE136783.014	%	40 - 130%	94
Dibromofluoromethane (Surrogate)	TB1	SE136783.013	%	40 - 130%	108
	RB1	SE136783.014	%	40 - 130%	106

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	95
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	86
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	97
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	92
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	86
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	92
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	88
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	90
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	87
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	83
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	85
	QD1	SE136783.012	%	60 - 130%	83
d4-1,2-dichloroethane (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	101
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	91
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	103
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	99
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	92
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	95
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	96
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	96
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	94
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	95
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	94
	QD1	SE136783.012	%	60 - 130%	92
d8-toluene (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	97
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	90
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	101
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	95
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	88
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	90
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	92
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	93
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	91
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	89
	BH7_0.15-0.3	SE136783.011	%	60 - 130%	92
	QD1	SE136783.012	%	60 - 130%	88
Dibromofluoromethane (Surrogate)	BH1_0.2-0.4	SE136783.001	%	60 - 130%	90
	BH2_0.2-0.4	SE136783.002	%	60 - 130%	83
	BH2_0.6-0.8	SE136783.003	%	60 - 130%	92
	BH3_0.2-0.4	SE136783.004	%	60 - 130%	83
	BH4_0.2-0.4	SE136783.005	%	60 - 130%	79
	BH5_0.2-0.4	SE136783.006	%	60 - 130%	83
	BH5_0.6-0.8	SE136783.007	%	60 - 130%	84
	BH5_1.3-1.5	SE136783.008	%	60 - 130%	85
	BH6_0.2-0.4	SE136783.009	%	60 - 130%	83
	BH6_0.5-0.7	SE136783.010	%	60 - 130%	82
	BH7_0.15-0.3	SE136783.011	%	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 Soil (continued) — Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	QD1	SE136783.012	%	60 - 130%	80

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	RB1	SE136783.014	%	40 - 130%	88
d4-1,2-dichloroethane (Surrogate)	RB1	SE136783.014	%	60 - 130%	107
d8-toluene (Surrogate)	RB1	SE136783.014	%	40 - 130%	94
Dibromofluoromethane (Surrogate)	RB1	SE136783.014	%	40 - 130%	106

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
LB073294.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB073148.001	Mercury	mg/kg	0.01	<0.01

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073161.001		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)	%	-	113

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073161.001		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)	%	-	90
		d14-p-terphenyl (Surrogate)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB073161.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB073161.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	76
		2-fluorobiphenyl (Surrogate)	%	-	78
		d14-p-terphenyl (Surrogate)	%	-	98

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073161.001		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)	%	-	113

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

Sample Number	Parameter	Units	LOR	Result
LB073144.001	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
LB073152.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB073161.001	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
LB073162.001	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

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

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

VOC's in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB073167.001	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)	%	-	108
		d4-1,2-dichloroethane (Surrogate)	%	-	114
		d8-toluene (Surrogate)	%	-	113
		Bromofluorobenzene (Surrogate)	%	-	110
	Totals	Total BTEX*	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB073232.001	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)	%	-	104
		d4-1,2-dichloroethane (Surrogate)	%	-	106
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	89

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073167.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	108
		d4-1,2-dichloroethane (Surrogate)	%	-	114
		d8-toluene (Surrogate)	%	-	113

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB073232.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	104
		d4-1,2-dichloroethane (Surrogate)	%	-	106
		d8-toluene (Surrogate)	%	-	94
		Bromofluorobenzene (Surrogate)	%	-	89

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 %
SE136783.007	LB073148.014	Mercury	mg/kg	0.01	0.16	0.16	61	0
SE136783.012	LB073148.020	Mercury	mg/kg	0.01	0.82	0.95	36	14

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136745.002	LB073187.011	% Moisture	%w/w	0.5	26.488095238	25.454545454	34	4
SE136783.001	LB073187.022	% Moisture	%	0.5	14	15	37	8
SE136783.011	LB073187.033	% Moisture	%	0.5	16	16	36	2
SE136813.003	LB073187.042	% Moisture	%	0.5	17.084282460	17.326732673	36	1

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.004	LB073161.009		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.17	30	1

OP Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.010	LB073161.016		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR

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 %
SE136783.010	LB073161.017		Naphthalene	mg/kg	0.1	0.2	0.1	104	22
			2-methylnaphthalene	mg/kg	0.1	0.2	<0.1	99	79
			1-methylnaphthalene	mg/kg	0.1	0.4	<0.1	81	111 ③
			Acenaphthylene	mg/kg	0.1	0.3	0.3	63	27
			Acenaphthene	mg/kg	0.1	0.1	<0.1	173	0
			Fluorene	mg/kg	0.1	0.1	<0.1	121	26
			Phenanthrene	mg/kg	0.1	1.7	1.1	37	41 ②
			Anthracene	mg/kg	0.1	0.5	0.3	57	40
			Fluoranthene	mg/kg	0.1	4.2	2.6	33	47 ②
			Pyrene	mg/kg	0.1	4.1	2.6	33	47 ②
			Benzo(a)anthracene	mg/kg	0.1	2.4	1.5	35	44 ②
			Chrysene	mg/kg	0.1	2.3	1.5	35	43 ②
			Benzo(b&j)fluoranthene	mg/kg	0.1	2.6	1.8	35	39 ②
			Benzo(k)fluoranthene	mg/kg	0.1	2.0	1.3	36	44 ②
			Benzo(a)pyrene	mg/kg	0.1	3.0	1.9	34	41 ②
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	1.8	1.2	37	44 ②
			Dibenzo(a&h)anthracene	mg/kg	0.1	0.2	0.1	84	49
			Benzo(ghi)perylene	mg/kg	0.1	1.6	1.0	38	45 ②
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	4.1	2.7	16	42 ②
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	4.1	2.7	19	42 ②
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	4.1	2.7	16	42 ②
			Total PAH	mg/kg	0.8	28	17	34	45 ②
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	30	5
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	2

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.004	LB073161.009		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	1

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.007	LB073144.014	Arsenic, As	mg/kg	3	29	25	34	15
		Cadmium, Cd	mg/kg	0.3	0.4	0.4	109	5
		Chromium, Cr	mg/kg	0.3	14	13	34	9
		Copper, Cu	mg/kg	0.5	79	81	31	2
		Lead, Pb	mg/kg	1	34	35	33	2
		Nickel, Ni	mg/kg	0.5	9.6	6.5	36	38 ②
		Zinc, Zn	mg/kg	0.5	230	220	31	5
SE136783.012	LB073144.020	Arsenic, As	mg/kg	3	59	52	32	14
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	175	0
		Chromium, Cr	mg/kg	0.3	10	10	35	1
		Copper, Cu	mg/kg	0.5	29	32	32	13
		Lead, Pb	mg/kg	1	720	580	30	22
		Nickel, Ni	mg/kg	0.5	7.3	7.8	37	7
		Zinc, Zn	mg/kg	0.5	76	84	32	9

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.014	LB073152.021	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

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.

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

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.014	LB073152.021		Copper, Cu	µg/L	1	<1	<1	200	0
			Lead, Pb	µg/L	1	<1	<1	200	0
			Nickel, Ni	µg/L	1	<1	<1	200	0
			Zinc, Zn	µg/L	5	79	69	22	13

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.010	LB073161.017		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	120	95	71	25
			TRH C29-C36	mg/kg	45	100	83	79	21
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	220	180	85	23
			TRH C10-C40 Total	mg/kg	210	220	<210	134	6
		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	210	160	78	25
			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	Original	Duplicate	Criteria %	RPD %
SE136783.010	LB073167.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	0.1	0.1	125	10
			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	-	4.1	4.2	50	2
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	4.9	50	3
			d8-toluene (Surrogate)	mg/kg	-	4.5	4.6	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.1	4.4	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
SE136783.012	LB073167.017	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	0.2	0.2	93	13
			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	0.2	93	38
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	4.0	50	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.6	4.7	50	2
			d8-toluene (Surrogate)	mg/kg	-	4.4	4.4	50	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.2	4.3	50	2
		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 %
SE136783.010	LB073167.014		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	-	4.1	4.2	30	2
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	4.9	30	3
			d8-toluene (Surrogate)	mg/kg	-	4.5	4.6	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.1	4.4	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
SE136783.012	LB073167.017		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	4.0	30	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.6	4.7	30	2
			d8-toluene (Surrogate)	mg/kg	-	4.4	4.4	30	0
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.2	4.3	30	2
		VPH F Bands	Benzene (F0)	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.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136783.012	LB073167.017	VPH F Bands	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 %
LB073148.002	Mercury	mg/kg	0.01	0.24	0.2	70 - 130	120

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073161.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	110
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	107
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	103
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	104
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	111
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	104
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	40 - 130	107

OP Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073161.002		Dichlorvos	mg/kg	0.5	2.1	2	60 - 140	103
		Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	94
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.6	2	60 - 140	79
		Ethion	mg/kg	0.2	2.2	2	60 - 140	111
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073161.002		Naphthalene	mg/kg	0.1	4.2	4	60 - 140	106
		Acenaphthylene	mg/kg	0.1	4.3	4	60 - 140	107
		Acenaphthene	mg/kg	0.1	4.5	4	60 - 140	112
		Phenanthrene	mg/kg	0.1	4.5	4	60 - 140	111
		Anthracene	mg/kg	0.1	4.6	4	60 - 140	115
		Fluoranthene	mg/kg	0.1	4.1	4	60 - 140	101
		Pyrene	mg/kg	0.1	4.2	4	60 - 140	106
		Benzo(a)pyrene	mg/kg	0.1	4.6	4	60 - 140	114
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	72
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	74
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073161.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	119

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073144.002	Arsenic, As	mg/kg	3	50	50	80 - 120	100
	Cadmium, Cd	mg/kg	0.3	49	50	80 - 120	98
	Chromium, Cr	mg/kg	0.3	48	50	80 - 120	97
	Copper, Cu	mg/kg	0.5	49	50	80 - 120	99
	Lead, Pb	mg/kg	1	49	50	80 - 120	98
	Nickel, Ni	mg/kg	0.5	48	50	80 - 120	96
	Zinc, Zn	mg/kg	0.5	49	50	80 - 120	99

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073152.002	Arsenic, As	µg/L	1	20	20	80 - 120	98
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	101
	Chromium, Cr	µg/L	1	20	20	80 - 120	101
	Copper, Cu	µg/L	1	21	20	80 - 120	106
	Lead, Pb	µg/L	1	20	20	80 - 120	100
	Nickel, Ni	µg/L	1	21	20	80 - 120	104
	Zinc, Zn	µg/L	5	21	20	80 - 120	106

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 %
LB073161.002		TRH C10-C14	mg/kg	20	35	40	60 - 140	88
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	85
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	78
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	35	40	60 - 140	88
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	83
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073162.002		TRH C10-C14	µg/L	50	1000	1200	60 - 140	84
		TRH C15-C28	µg/L	200	1100	1200	60 - 140	95
		TRH C29-C36	µg/L	200	1100	1200	60 - 140	96
	TRH F Bands	TRH >C10-C16 (F2)	µg/L	60	1100	1200	60 - 140	89
		TRH >C16-C34 (F3)	µg/L	500	1200	1200	60 - 140	99
		TRH >C34-C40 (F4)	µg/L	500	560	600	60 - 140	94

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073167.002	Monocyclic	Benzene	mg/kg	0.1	3.0	2.9	60 - 140	103
	Aromatic	Toluene	mg/kg	0.1	2.9	2.9	60 - 140	99
		Ethylbenzene	mg/kg	0.1	2.4	2.9	60 - 140	83
		m/p-xylene	mg/kg	0.2	5.1	5.8	60 - 140	88
		o-xylene	mg/kg	0.1	2.6	2.9	60 - 140	88
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.6	5	60 - 140	93
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	5	60 - 140	100
		d8-toluene (Surrogate)	mg/kg	-	5.1	5	60 - 140	101
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	5	60 - 140	101

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073232.002	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	49	45.45	60 - 140	108
		m/p-xylene	µg/L	1	98	90.9	60 - 140	107
		o-xylene	µg/L	0.5	49	45.45	60 - 140	108
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.0	5	60 - 140	99
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	5	60 - 140	105
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	µg/L	-	4.5	5	60 - 140	89

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073167.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	89
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	86
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.6	5	60 - 140	93
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	5	60 - 140	100
		d8-toluene (Surrogate)	mg/kg	-	5.1	5	60 - 140	101
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	5	60 - 140	101
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	84

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073232.002		TRH C6-C10	µg/L	50	870	946.63	60 - 140	92
		TRH C6-C9	µg/L	40	820	818.71	60 - 140	100
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.0	5	60 - 140	99
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	5	60 - 140	105
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	µg/L	-	4.5	5	60 - 140	89
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	580	639.67	60 - 140	90

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%
SE136661.015	LB073294.004	Mercury	mg/L	0.0001	0.0084	-0.0784	0.008	106

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE136767.003	LB073148.004	Mercury	mg/kg	0.01	0.23	0.05425257696	0.2	90

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE136783.003	LB073161.008		Naphthalene	mg/kg	0.1	4.6	<0.1	4	115
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	5.0	0.2	4	119
			Acenaphthene	mg/kg	0.1	4.5	<0.1	4	113
			Fluorene	mg/kg	0.1	<0.1	0.3	-	-
			Phenanthrene	mg/kg	0.1	6.4	2.0	4	110
			Anthracene	mg/kg	0.1	5.8	0.4	4	135
			Fluoranthene	mg/kg	0.1	5.8	2.6	4	80
			Pyrene	mg/kg	0.1	5.6	2.5	4	80
			Benzo(a)anthracene	mg/kg	0.1	<0.1	1.2	-	-
			Chrysene	mg/kg	0.1	<0.1	1.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	1.0	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.9	-	-
			Benzo(a)pyrene	mg/kg	0.1	5.9	1.3	4	116
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.7	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.6	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	5.9	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	6.0	1.8	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	6.0	1.8	-	-
			Total PAH	mg/kg	0.8	44	15	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.4	-	94
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.4	-	90
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	104

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE136767.003	LB073144.004	Arsenic, As	mg/kg	3	55	1.84629705530	50	106
		Cadmium, Cd	mg/kg	0.3	51	0.20917347136	50	102
		Chromium, Cr	mg/kg	0.3	65	12.55980245567	50	105
		Copper, Cu	mg/kg	0.5	67	11.5322998170[illegible]	50	111
		Lead, Pb	mg/kg	1	63	12.2259525401[illegible]	50	102
		Nickel, Ni	mg/kg	0.5	55	3.51404534900	50	102
		Zinc, Zn	mg/kg	0.5	86	27.62674940191	50	117

TRH (Total Recoverable Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE136783.003	LB073161.008		TRH C10-C14	mg/kg	20	39	<20	40	98
			TRH C15-C28	mg/kg	45	<45	<45	40	98
			TRH C29-C36	mg/kg	45	<45	<45	40	78
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	<110	-	-
			TRH C10-C40 Total	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	39	<25	40	98
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	39	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	88
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR

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

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason 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%
SE136783.001	LB073167.004	Monocyclic	Benzene	mg/kg	0.1	2.6	<0.1	2.9	91
		Aromatic	Toluene	mg/kg	0.1	2.5	<0.1	2.9	88
			Ethylbenzene	mg/kg	0.1	2.7	<0.1	2.9	93
			m/p-xylene	mg/kg	0.2	5.8	<0.2	5.8	99
			o-xylene	mg/kg	0.1	2.9	<0.1	2.9	99
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	4.5	5	79
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.5	5.1	5	89
			d8-toluene (Surrogate)	mg/kg	-	4.3	4.8	5	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.6	4.7	5	111
		Totals	Total Xylenes*	mg/kg	0.3	8.6	<0.3	-	-
			Total BTEX*	mg/kg	0.6	17	<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%
SE136783.001	LB073167.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	91
			TRH C6-C9	mg/kg	20	20	<20	23.2	87
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	4.5	5	79
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.5	5.1	5	89
			d8-toluene (Surrogate)	mg/kg	-	4.3	4.8	5	87
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.6	4.7	5	111
		VPH F	Benzene (F0)	mg/kg	0.1	2.6	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	82

MATRIX SPIKE DUPLICATES

SE136783 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

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

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.

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Daniel Soliman
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
Email	Daniel.Soliman@eiaustralia.com.au
Project	**E22390 - 36 Lonsdale Street - Lilyfield**
Order Number	**E22390**
Samples	8

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
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Email	au.environmental.sydney@sgs.com
SGS Reference	SE136783 R0
Report Number	0000104337
Date Reported	05 Mar 2015
Date Received	02 Mar 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.
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Deanne Norris
Organic Chemist

Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Asbestos Analyst

ANALYTICAL REPORT

SE136783 R0

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE136783.001	BH1_0.2-0.4	Soil	69g Sand,soil,rocks	02 Mar 2015	No Asbestos Found	<0.01
SE136783.002	BH2_0.2-0.4	Soil	60g Sand,soil,rocks	02 Mar 2015	No Asbestos Found Organic Fibres Detected	<0.01
SE136783.004	BH3_0.2-0.4	Soil	55g Sand,rocks	02 Mar 2015	No Asbestos Found	<0.01
SE136783.005	BH4_0.2-0.4	Soil	120g Sand	02 Mar 2015	No Asbestos Found	<0.01
SE136783.006	BH5_0.2-0.4	Soil	51g Sand,soil	02 Mar 2015	No Asbestos Found	<0.01
SE136783.009	BH6_0.2-0.4	Soil	39g Sand,soil,rocks	02 Mar 2015	No Asbestos Found	<0.01
SE136783.010	BH6_0.5-0.7	Soil	64g Sand,soil,rocks	02 Mar 2015	No Asbestos Found Organic Fibres Detected	<0.01
SE136783.011	BH7_0.15-0.3	Soil	75g Sand,rocks	02 Mar 2015	No Asbestos Found	<0.01

METHOD SUMMARY

SE136783 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	*	-	Not Accredited
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 polarized light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarized light microscopy, including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarized 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

STATEMENT OF QA/QC PERFORMANCE

SE136783A R0

CLIENT DETAILS

Contact	Voula Terlegas
Client	Environmental Investigations
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Facsimile	02 9516 0741
Email	Voula.Terlegas@eiaustralia.com.au
Project	**E22390 -36 Lonsdale Street-Lilyfield-Add**
Order Number	**E22390**
Samples	15

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
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Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE136783A R0
Report Number	0000104912
Date Reported	11 Mar 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 (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Sample counts by matrix	1 Soil	Type of documentation received	Email
Date documentation received	5/3/15@6:23pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.6°C
Sample container provider	SGS	Turnaround time requested	Three Days
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

SE136783A 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

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH5_1.0-1.2	SE136783A.015	LB073562	02 Mar 2015	02 Mar 2015	16 Mar 2015	10 Mar 2015	15 Mar 2015	11 Mar 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
BH5_1.0-1.2	SE136783A.015	LB073376	02 Mar 2015	02 Mar 2015	16 Mar 2015	06 Mar 2015	15 Apr 2015	11 Mar 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
BH5_1.0-1.2	SE136783A.015	LB073376	02 Mar 2015	02 Mar 2015	16 Mar 2015	06 Mar 2015	15 Apr 2015	11 Mar 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
BH5_1.0-1.2	SE136783A.015	LB073382	02 Mar 2015	02 Mar 2015	16 Mar 2015	06 Mar 2015	15 Apr 2015	11 Mar 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
BH5_1.0-1.2	SE136783A.015	LB073382	02 Mar 2015	02 Mar 2015	16 Mar 2015	06 Mar 2015	15 Apr 2015	11 Mar 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 Soil — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	70 - 130%	102
d14-p-terphenyl (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	70 - 130%	110
d5-nitrobenzene (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	70 - 130%	100

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	102
d4-1,2-dichloroethane (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	103
d8-toluene (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	103
Dibromofluoromethane (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	97

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	102
d4-1,2-dichloroethane (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	103
d8-toluene (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	103
Dibromofluoromethane (Surrogate)	BH5_1.0-1.2	SE136783A.015	%	60 - 130%	97

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

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

Sample Number		Parameter	Units	LOR	Result
LB073376.001		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	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	106
		2-fluorobiphenyl (Surrogate)	%	-	82
		d14-p-terphenyl (Surrogate)	%	-	130

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073376.001		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

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073382.001	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)	%	-	93
		d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	95
	Totals	Total BTEX*	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB073382.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	93
		d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	104

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 %
SE136844.001	LB073562.011	% Moisture	%w/w	0.5	26	23	34	13
SE136844.011	LB073562.022	% Moisture	%	0.5	32	31	33	2
SE136844.015	LB073562.027	% Moisture	%	0.5	12	11	39	5

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE136936.011	LB073376.018		Naphthalene	mg/kg	0.1	0	0	200	0
			2-methylnaphthalene	mg/kg	0.1	0	0	200	0
			1-methylnaphthalene	mg/kg	0.1	0	0	200	0
			Acenaphthylene	mg/kg	0.1	0	0	200	0
			Acenaphthene	mg/kg	0.1	0	0	200	0
			Fluorene	mg/kg	0.1	0	0	200	0
			Phenanthrene	mg/kg	0.1	0	0	200	0
			Anthracene	mg/kg	0.1	0	0	200	0
			Fluoranthene	mg/kg	0.1	0	0	200	0
			Pyrene	mg/kg	0.1	0	0	200	0
			Benzo(a)anthracene	mg/kg	0.1	0	0	200	0
			Chrysene	mg/kg	0.1	0	0	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0	0	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	0	0	200	0
			Benzo(a)pyrene	mg/kg	0.1	0	0	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0	0	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	0	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	0	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ (mg/kg)	0.2	0	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	0.242	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	0.121	0.121	175	0
			Total PAH	mg/kg	0.8	0	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.38	0.43	30	12
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.49	0.47	30	4
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.53	0.64	30	19

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 Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073376.002		Naphthalene	mg/kg	0.1	4.2	4	60 - 140	106
		Acenaphthylene	mg/kg	0.1	2.9	4	60 - 140	72
		Acenaphthene	mg/kg	0.1	4.1	4	60 - 140	103
		Phenanthrene	mg/kg	0.1	4.2	4	60 - 140	105
		Anthracene	mg/kg	0.1	4.2	4	60 - 140	105
		Fluoranthene	mg/kg	0.1	4.3	4	60 - 140	107
		Pyrene	mg/kg	0.1	4.1	4	60 - 140	102
		Benzo(a)pyrene	mg/kg	0.1	4.7	4	60 - 140	117
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	82
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	76
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073376.002		TRH C10-C14	mg/kg	20	35	40	60 - 140	88
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	88
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	70
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	37	40	60 - 140	93
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	80
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	65

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073382.002	Monocyclic	Benzene	mg/kg	0.1	2.9	2.9	60 - 140	99
	Aromatic	Toluene	mg/kg	0.1	2.6	2.9	60 - 140	91
		Ethylbenzene	mg/kg	0.1	2.6	2.9	60 - 140	89
		m/p-xylene	mg/kg	0.2	5.6	5.8	60 - 140	97
		o-xylene	mg/kg	0.1	2.7	2.9	60 - 140	94
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	5.2	5	60 - 140	105
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.8	5	60 - 140	116
		d8-toluene (Surrogate)	mg/kg	-	5.5	5	60 - 140	110
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	5	60 - 140	100

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073382.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	96
		TRH C6-C9	mg/kg	20	22	23.2	60 - 140	95
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	5.2	5	60 - 140	105
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.8	5	60 - 140	116
		d8-toluene (Surrogate)	mg/kg	-	5.5	5	60 - 140	110
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	5	60 - 140	100
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	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.

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE136936.002	LB073376.007		Naphthalene	mg/kg	0.1	4.0	0	4	101
			2-methylnaphthalene	mg/kg	0.1	<0.1	0	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	-	-
			Acenaphthylene	mg/kg	0.1	3.2	0	4	80
			Acenaphthene	mg/kg	0.1	4.2	0	4	104
			Fluorene	mg/kg	0.1	<0.1	0	-	-
			Phenanthrene	mg/kg	0.1	4.4	0.14	4	106
			Anthracene	mg/kg	0.1	4.3	0	4	108
			Fluoranthene	mg/kg	0.1	4.5	0.16	4	109
			Pyrene	mg/kg	0.1	4.3	0.2	4	103
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0	-	-
			Chrysene	mg/kg	0.1	<0.1	0	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.6	0	4	115
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	0	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	4.6	0	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	4.7	0.242	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	4.7	0.121	-	-
			Total PAH	mg/kg	0.8	34	0.5	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.44	-	78
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.41	-	70
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.62	-	104

MATRIX SPIKE DUPLICATES

SE136783A 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

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

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.

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Voula Terlegas
Client	Environmental Investigations
Address	Suite 6.01, 55 Miller Street PYRMONT NSW 2009
Telephone	02 9516 0722
Facsimile	02 9516 0741
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Project	**E22390 -36 Lonsdale Street-Lilyfield-Add**
Order Number	**E22390**
Samples	15
Date Received	2/3/2015

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
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SGS Reference	**SE136783A R0**
Report Number	0000104913
Date Reported	11/3/2015
Date Started	10/3/2015

COMMENTS

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

SIGNATORIES

Ly Kim Ha
Organic Section Head

VOC's in Soil [AN433/AN434]

PARAMETER	UOM	LOR	BH5_1.0-1.2 SOIL - 2/3/2015 SE136783A.015
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	**0.1**
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	**0.3**
o-xylene	mg/kg	0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433/AN434/AN410]

PARAMETER	UOM	LOR	BH5_1.0-1.2 SOIL - 2/3/2015 SE136783A.015
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]

PARAMETER	UOM	LOR	BH5_1.0-1.2 SOIL - 2/3/2015 SE136783A.015
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	45	**81**
TRH C29-C36	mg/kg	45	**67**
TRH C37-C40	mg/kg	100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	**130**
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	**150**
TRH C10-C40 Total	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420]

PARAMETER	UOM	LOR	BH5_1.0-1.2 SOIL - 2/3/2015 SE136783A.015
Naphthalene	mg/kg	0.1	**0.3**
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	**0.2**
Fluorene	mg/kg	0.1	**0.2**
Phenanthrene	mg/kg	0.1	**1.2**
Anthracene	mg/kg	0.1	**0.2**
Fluoranthene	mg/kg	0.1	**1.9**
Pyrene	mg/kg	0.1	**1.6**
Benzo(a)anthracene	mg/kg	0.1	**1.1**
Chrysene	mg/kg	0.1	**0.8**
Benzo(b&j)fluoranthene	mg/kg	0.1	**1.0**
Benzo(k)fluoranthene	mg/kg	0.1	**0.5**
Benzo(a)pyrene	mg/kg	0.1	**1.0**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.6**
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.6**
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	**1.4**
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	**1.5**
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	**1.4**
Total PAH	mg/kg	0.8	**11**

Moisture Content [AN002]

PARAMETER	UOM	LOR	BH5_1.0-1.2 SOIL - 2/3/2015 SE136783A.015
% Moisture	%	0.5	**20**

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.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
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.
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	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/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.

FOOTNOTES

*	Analysis not covered by the scope of accreditation.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
^	Performed by outside laboratory.	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.

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 124396

Client:
Environmental Investigations
Suite 6.01, 55 Miller Street
Pyrmont
NSW 2009

Attention: Daniel Soliman

Sample log in details:

Your Reference:	**E22390, Lilyfield**		
No. of samples:	1 Soil		
Date samples received / completed instructions received	02/03/15	/	02/03/15

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:	9/03/15	/	4/03/15
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	124396-1
Your Reference	----------	QT1
Date Sampled	----------	02/03/2015
Type of sample		Soil
Date extracted	-	03/03/2015
Date analysed	-	03/03/2015
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	%	98

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	124396-1
Your Reference	----------	QT1
Date Sampled	----------	02/03/2015
Type of sample		Soil
Date extracted	-	03/03/2015
Date analysed	-	03/03/2015
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	130
TRH>C$_{34}$-C$_{40}$	mg/kg	<100
Surrogate o-Terphenyl	%	95

Acid Extractable metals in soil		
Our Reference:	UNITS	124396-1
Your Reference	----------	QT1
Date Sampled	----------	02/03/2015
Type of sample		Soil
Date digested	-	03/03/2015
Date analysed	-	03/03/2015
Arsenic	mg/kg	11
Cadmium	mg/kg	<0.4
Chromium	mg/kg	10
Copper	mg/kg	26
Lead	mg/kg	180
Mercury	mg/kg	0.4
Nickel	mg/kg	5
Zinc	mg/kg	110

Moisture		
Our Reference:	UNITS	124396-1
Your Reference	----------	QT1
Date Sampled	----------	02/03/2015
Type of sample		Soil
Date prepared	-	3/03/2015
Date analysed	-	4/03/2015
Moisture	%	12

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.
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	-			03/03/2015	[NT]	[NT]	LCS-3	03/03/2015
Date analysed	-			03/03/2015	[NT]	[NT]	LCS-3	03/03/2015
$TRHC_6$ - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	105%
$TRHC_6$ - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	105%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-3	109%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-3	109%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	101%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-3	104%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	101%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	101	[NT]	[NT]	LCS-3	93%

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	-			03/03/2015	[NT]	[NT]	LCS-3	03/03/2015
Date analysed	-			03/03/2015	[NT]	[NT]	LCS-3	03/03/2015
$TRHC_{10}$ - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	115%
$TRHC_{15}$ - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	115%
$TRHC_{29}$ - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	83%
$TRH>C_{10}$-C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	115%
$TRH>C_{16}$-C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	115%
$TRH>C_{34}$-C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	83%
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	LCS-3	108%

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 digested	-			03/03/2015	[NT]	[NT]	LCS-1	03/03/2015
Date analysed	-			03/03/2015	[NT]	[NT]	LCS-1	03/03/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	113%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-1	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	108%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	108%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	93%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	105%

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
NA: 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 and 10-140% for SVOC 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.

STATEMENT OF QA/QC PERFORMANCE

SE137034 R0

CLIENT DETAILS

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Project	**E22390 - 36 Lonsdale St - Lilyfield**
Order Number	**E22390**
Samples	3

LABORATORY DETAILS

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SGS Reference	SE137034 R0
Report Number	0000105024
Date Reported	12 Mar 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 (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Sample counts by matrix	3 Waters	Type of documentation received	COC
Date documentation received	9/3/2015	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.8°C
Sample container provider	SGS	Turnaround time requested	Three Days
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

SE137034 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
MW1	SE137034.001	LB073717	09 Mar 2015	09 Mar 2015	06 Apr 2015	12 Mar 2015	06 Apr 2015	12 Mar 2015
GWQD1	SE137034.002	LB073717	09 Mar 2015	09 Mar 2015	06 Apr 2015	12 Mar 2015	06 Apr 2015	12 Mar 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
MW1	SE137034.001	LB073515	09 Mar 2015	09 Mar 2015	16 Mar 2015	10 Mar 2015	19 Apr 2015	12 Mar 2015
GWQD1	SE137034.002	LB073515	09 Mar 2015	09 Mar 2015	16 Mar 2015	10 Mar 2015	19 Apr 2015	12 Mar 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
MW1	SE137034.001	LB073572	09 Mar 2015	09 Mar 2015	05 Sep 2015	10 Mar 2015	05 Sep 2015	11 Mar 2015
GWQD1	SE137034.002	LB073572	09 Mar 2015	09 Mar 2015	05 Sep 2015	10 Mar 2015	05 Sep 2015	11 Mar 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
MW1	SE137034.001	LB073515	09 Mar 2015	09 Mar 2015	16 Mar 2015	10 Mar 2015	19 Apr 2015	12 Mar 2015
GWQD1	SE137034.002	LB073515	09 Mar 2015	09 Mar 2015	16 Mar 2015	10 Mar 2015	19 Apr 2015	12 Mar 2015

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
MW1	SE137034.001	LB073651	09 Mar 2015	09 Mar 2015	16 Mar 2015	11 Mar 2015	20 Apr 2015	12 Mar 2015
GWQD1	SE137034.002	LB073651	09 Mar 2015	09 Mar 2015	16 Mar 2015	11 Mar 2015	20 Apr 2015	12 Mar 2015
GWQTB1	SE137034.003	LB073651	09 Mar 2015	09 Mar 2015	16 Mar 2015	11 Mar 2015	20 Apr 2015	12 Mar 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
MW1	SE137034.001	LB073651	09 Mar 2015	09 Mar 2015	16 Mar 2015	11 Mar 2015	20 Apr 2015	12 Mar 2015
GWQD1	SE137034.002	LB073651	09 Mar 2015	09 Mar 2015	16 Mar 2015	11 Mar 2015	20 Apr 2015	12 Mar 2015
GWQTB1	SE137034.003	LB073651	09 Mar 2015	09 Mar 2015	16 Mar 2015	11 Mar 2015	20 Apr 2015	12 Mar 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)	MW1	SE137034.001	%	40 - 130%	66
d14-p-terphenyl (Surrogate)	MW1	SE137034.001	%	40 - 130%	92
d5-nitrobenzene (Surrogate)	MW1	SE137034.001	%	40 - 130%	42

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW1	SE137034.001	%	40 - 130%	97
	GWQD1	SE137034.002	%	40 - 130%	92
	GWQTB1	SE137034.003	%	40 - 130%	92
d4-1,2-dichloroethane (Surrogate)	MW1	SE137034.001	%	40 - 130%	106
	GWQD1	SE137034.002	%	40 - 130%	110
	GWQTB1	SE137034.003	%	40 - 130%	107
d8-toluene (Surrogate)	MW1	SE137034.001	%	40 - 130%	99
	GWQD1	SE137034.002	%	40 - 130%	101
	GWQTB1	SE137034.003	%	40 - 130%	97
Dibromofluoromethane (Surrogate)	MW1	SE137034.001	%	40 - 130%	107
	GWQD1	SE137034.002	%	40 - 130%	113
	GWQTB1	SE137034.003	%	40 - 130%	110

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	MW1	SE137034.001	%	40 - 130%	91
	GWQD1	SE137034.002	%	40 - 130%	92
d4-1,2-dichloroethane (Surrogate)	MW1	SE137034.001	%	60 - 130%	109
	GWQD1	SE137034.002	%	60 - 130%	110
d8-toluene (Surrogate)	MW1	SE137034.001	%	40 - 130%	100
	GWQD1	SE137034.002	%	40 - 130%	101
Dibromofluoromethane (Surrogate)	MW1	SE137034.001	%	40 - 130%	108
	GWQD1	SE137034.002	%	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
LB073717.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB073515.001		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)	%	-	108
		2-fluorobiphenyl (Surrogate)	%	-	104
		d14-p-terphenyl (Surrogate)	%	-	122

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result
LB073572.001	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
LB073515.001	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
LB073651.001	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
LB073651.001	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)	%	-	107
		d4-1,2-dichloroethane (Surrogate)	%	-	104
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	96
	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
LB073651.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	109
		d4-1,2-dichloroethane (Surrogate)	%	-	107
		d8-toluene (Surrogate)	%	-	100
		Bromofluorobenzene (Surrogate)	%	-	89

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 %
SE137063.001	LB073717.015	Mercury	µg/L	0.0001	0	0	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 %
LB073515.002		Naphthalene	µg/L	0.1	33	40	60 - 140	84
		Acenaphthylene	µg/L	0.1	42	40	60 - 140	106
		Acenaphthene	µg/L	0.1	44	40	60 - 140	110
		Phenanthrene	µg/L	0.1	46	40	60 - 140	116
		Anthracene	µg/L	0.1	41	40	60 - 140	103
		Fluoranthene	µg/L	0.1	41	40	60 - 140	103
		Pyrene	µg/L	0.1	47	40	60 - 140	117
		Benzo(a)pyrene	µg/L	0.1	45	40	60 - 140	114
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.5	40 - 130	78
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	82
		d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	104

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073572.002		Arsenic, As	µg/L	1	20	20	80 - 120	102
		Cadmium, Cd	µg/L	0.1	19	20	80 - 120	97
		Chromium, Cr	µg/L	1	20	20	80 - 120	101
		Copper, Cu	µg/L	1	20	20	80 - 120	101
		Lead, Pb	µg/L	1	20	20	80 - 120	100
		Nickel, Ni	µg/L	1	20	20	80 - 120	101
		Zinc, Zn	µg/L	5	21	20	80 - 120	104

TRH (Total Recoverable Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073515.002		TRH C10-C14	µg/L	50	1100	1200	60 - 140	93
		TRH C15-C28	µg/L	200	1100	1200	60 - 140	95
		TRH C29-C36	µg/L	200	1200	1200	60 - 140	97
	TRH F Bands	TRH >C10-C16 (F2)	µg/L	60	1100	1200	60 - 140	94
		TRH >C16-C34 (F3)	µg/L	500	1200	1200	60 - 140	96
		TRH >C34-C40 (F4)	µg/L	500	600	600	60 - 140	100

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073651.002	Halogenated	1,1-dichloroethene	µg/L	0.5	44	45.45	60 - 140	98
	Aliphatics	1,2-dichloroethane	µg/L	0.5	44	45.45	60 - 140	97
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	46	45.45	60 - 140	100
	Halogenated	Chlorobenzene	µg/L	0.5	45	45.45	60 - 140	100
	Monocyclic	Benzene	µg/L	0.5	44	45.45	60 - 140	97
	Aromatic	Toluene	µg/L	0.5	45	45.45	60 - 140	100
		Ethylbenzene	µg/L	0.5	46	45.45	60 - 140	100
		m/p-xylene	µg/L	1	91	90.9	60 - 140	100
		o-xylene	µg/L	0.5	45	45.45	60 - 140	100
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.6	5	60 - 140	91
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.7	5	60 - 140	94
		d8-toluene (Surrogate)	µg/L	-	4.6	5	60 - 140	92
		Bromofluorobenzene (Surrogate)	µg/L	-	4.9	5	60 - 140	98
	Trihalomethan	Chloroform (THM)	µg/L	0.5	44	45.45	60 - 140	96

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB073651.002		TRH C6-C10	µg/L	50	950	946.63	60 - 140	100
		TRH C6-C9	µg/L	40	770	818.71	60 - 140	94
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.8	5	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.0	5	60 - 140	99
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	94
		Bromofluorobenzene (Surrogate)	µg/L	-	4.8	5	60 - 140	95
	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%
SE136922.002	LB073717.004	Mercury	mg/L	0.0001	0.0073	<0.00005	0.008	91

MATRIX SPIKE DUPLICATES

SE137034 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

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

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.

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
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Project	**E22390 - 36 Lonsdale St - Lilyfield**	SGS Reference	**SE137034 R0**
Order Number	**E22390**	Report Number	0000105023
Samples	3	Date Reported	12 Mar 2015
Date Started	11 Mar 2015	Date Received	09 Mar 2015

COMMENTS

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

VPH/VOC - The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.

SIGNATORIES

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Parameter	Units	LOR	Sample Number: SE137034.001 Sample Matrix: Water Sample Date: 09 Mar 2015 Sample Name: MW1	SE137034.002 Water 09 Mar 2015 GWQD1	SE137034.003 Water 09 Mar 2015 GWQTB1
VOCs in Water Method: AN433/AN434					
Fumigants					
2,2-dichloropropane	µg/L	0.5	<25↑	-	-
1,2-dichloropropane	µg/L	0.5	<25↑	-	-
cis-1,3-dichloropropene	µg/L	0.5	<25↑	-	-
trans-1,3-dichloropropene	µg/L	0.5	<25↑	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	<25↑	-	-
Halogenated Aliphatics					
Dichlorodifluoromethane (CFC-12)	µg/L	5	<250↑	-	-
Chloromethane	µg/L	5	<250↑	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<15↑	-	-
Bromomethane	µg/L	10	<500↑	-	-
Chloroethane	µg/L	5	<250↑	-	-
Trichlorofluoromethane	µg/L	1	<50↑	-	-
Iodomethane	µg/L	5	<250↑	-	-
1,1-dichloroethene	µg/L	0.5	<25↑	-	-
Dichloromethane (Methylene chloride)	µg/L	5	<250↑	-	-
Allyl chloride	µg/L	2	<100↑	-	-
trans-1,2-dichloroethene	µg/L	0.5	<25↑	-	-
1,1-dichloroethane	µg/L	0.5	<25↑	-	-
cis-1,2-dichloroethene	µg/L	0.5	<25↑	-	-
Bromochloromethane	µg/L	0.5	<25↑	-	-
1,2-dichloroethane	µg/L	0.5	<25↑	-	-
1,1,1-trichloroethane	µg/L	0.5	<25↑	-	-
1,1-dichloropropene	µg/L	0.5	<25↑	-	-
Carbon tetrachloride	µg/L	0.5	<25↑	-	-
Dibromomethane	µg/L	0.5	<25↑	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<25↑	-	-
1,1,2-trichloroethane	µg/L	0.5	<25↑	-	-
1,3-dichloropropane	µg/L	0.5	<25↑	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<25↑	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<25↑	-	-
cis-1,4-dichloro-2-butene	µg/L	1	<50↑	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	<25↑	-	-
1,2,3-trichloropropane	µg/L	0.5	<25↑	-	-
trans-1,4-dichloro-2-butene	µg/L	1	<50↑	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<25↑	-	-
Hexachlorobutadiene	µg/L	0.5	<25↑	-	-
Halogenated Aromatics					
Chlorobenzene	µg/L	0.5	<25↑	-	-
Bromobenzene	µg/L	0.5	<25↑	-	-
2-chlorotoluene	µg/L	0.5	<25↑	-	-
4-chlorotoluene	µg/L	0.5	<25↑	-	-
1,3-dichlorobenzene	µg/L	0.5	<25↑	-	-
1,4-dichlorobenzene	µg/L	0.3	<15↑	-	-
1,2-dichlorobenzene	µg/L	0.5	<25↑	-	-
1,2,4-trichlorobenzene	µg/L	0.5	<25↑	-	-
1,2,3-trichlorobenzene	µg/L	0.5	<25↑	-	-
Monocyclic Aromatic Hydrocarbons					
Benzene	µg/L	0.5	<25↑	<25↑	<0.5
Toluene	µg/L	0.5	<25↑	<25↑	<0.5
Ethylbenzene	µg/L	0.5	<25↑	<25↑	<0.5
m/p-xylene	µg/L	1	<50↑	<50↑	<1
o-xylene	µg/L	0.5	<25↑	<25↑	<0.5
Styrene (Vinyl benzene)	µg/L	0.5	<25↑	-	-
Isopropylbenzene (Cumene)	µg/L	0.5	<25↑	-	-
n-propylbenzene	µg/L	0.5	<25↑	-	-

Parameter	Units	LOR	Sample Number: SE137034.001 Sample Matrix: Water Sample Date: 09 Mar 2015 Sample Name: MW1	SE137034.002 Water 09 Mar 2015 GWQD1	SE137034.003 Water 09 Mar 2015 GWQTB1
VOCs in Water Method: AN433/AN434 (continued)					
1,3,5-trimethylbenzene	µg/L	0.5	<25↑	-	-
tert-butylbenzene	µg/L	0.5	<25↑	-	-
1,2,4-trimethylbenzene	µg/L	0.5	<25↑	-	-
sec-butylbenzene	µg/L	0.5	<25↑	-	-
p-isopropyltoluene	µg/L	0.5	<25↑	-	-
n-butylbenzene	µg/L	0.5	<25↑	-	-
Nitrogenous Compounds					
Acrylonitrile	µg/L	0.5	<25↑	-	-
2-nitropropane	µg/L	100	<5000↑	-	-
Oxygenated Compounds					
Acetone (2-propanone)	µg/L	10	<500↑	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	<100↑	-	-
Vinyl acetate	µg/L	10	<500↑	-	-
MEK (2-butanone)	µg/L	10	<500↑	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<250↑	-	-
2-hexanone (MBK)	µg/L	5	<250↑	-	-
Polycyclic VOCs					
Naphthalene	µg/L	0.5	<25↑	<25↑	<0.5
Sulphonated Compounds					
Carbon disulfide	µg/L	2	<100↑	-	-
Surrogates					
Dibromofluoromethane (Surrogate)	%	-	**107**	**113**	**110**
d4-1,2-dichloroethane (Surrogate)	%	-	**106**	**110**	**107**
d8-toluene (Surrogate)	%	-	**99**	**101**	**97**
Bromofluorobenzene (Surrogate)	%	-	**97**	**92**	**92**
Totals					
Total Xylenes	µg/L	1.5	<75↑	<75↑	<1.5
Total BTEX	µg/L	3	<150↑	<150↑	<3
Total VOC	µg/L	10	-	-	-
Trihalomethanes					
Chloroform (THM)	µg/L	0.5	<25↑	-	-
Bromodichloromethane (THM)	µg/L	0.5	<25↑	-	-
Dibromochloromethane (THM)	µg/L	0.5	<25↑	-	-
Bromoform (THM)	µg/L	0.5	<25↑	-	-
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410					
TRH C6-C10	µg/L	50	<2500↑	<2500↑	-
TRH C6-C9	µg/L	40	<2000↑	<2000↑	-
Surrogates					
Dibromofluoromethane (Surrogate)	%	-	**108**	**113**	-
d4-1,2-dichloroethane (Surrogate)	%	-	**109**	**110**	-
d8-toluene (Surrogate)	%	-	**100**	**101**	-
Bromofluorobenzene (Surrogate)	%	-	**91**	**92**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE137034.001 Water 09 Mar 2015 MW1	SE137034.002 Water 09 Mar 2015 GWQD1	SE137034.003 Water 09 Mar 2015 GWQTB1
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410 (continued)					
VPH F Bands					
Benzene (F0)	µg/L	0.5	<25↑	<25↑	-
TRH C6-C10 minus BTEX (F1)	µg/L	50	<2500↑	<2500↑	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403					
TRH C10-C14	µg/L	50	<50	<50	-
TRH C15-C28	µg/L	200	**2000**	**2600**	-
TRH C29-C36	µg/L	200	**2000**	**2300**	-
TRH C37-C40	µg/L	200	<200	<200	-
TRH C10-C36	µg/L	450	**4000**	**4900**	-
TRH C10-C40	µg/L	650	**4000**	**4900**	-
TRH F Bands					
TRH >C10-C16 (F2)	µg/L	60	**62**	<60	-
TRH >C16-C34 (F3)	µg/L	500	**3500**	**4600**	-
TRH >C34-C40 (F4)	µg/L	500	**570**	<500	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420					
Naphthalene	µg/L	0.1	**0.3**	-	-
2-methylnaphthalene	µg/L	0.1	**0.2**	-	-
1-methylnaphthalene	µg/L	0.1	**0.3**	-	-
Acenaphthylene	µg/L	0.1	**0.8**	-	-
Acenaphthene	µg/L	0.1	**0.4**	-	-
Fluorene	µg/L	0.1	**0.6**	-	-
Phenanthrene	µg/L	0.1	**5.4**	-	-
Anthracene	µg/L	0.1	**1.4**	-	-
Fluoranthene	µg/L	0.1	**8.0**	-	-
Pyrene	µg/L	0.1	**8.1**	-	-
Benzo(a)anthracene	µg/L	0.1	**4.1**	-	-
Chrysene	µg/L	0.1	**2.8**	-	-
Benzo(b&j)fluoranthene	µg/L	0.1	**4.6**	-	-
Benzo(k)fluoranthene	µg/L	0.1	**2.0**	-	-
Benzo(a)pyrene	µg/L	0.1	**4.0**	-	-
Indeno(1,2,3-cd)pyrene	µg/L	0.1	**2.9**	-	-
Dibenzo(a&h)anthracene	µg/L	0.1	**0.3**	-	-
Benzo(ghi)perylene	µg/L	0.1	**2.8**	-	-
Total PAH (18)	µg/L	1	**49**	-	-
Surrogates					
d5-nitrobenzene (Surrogate)	%	-	**42**	-	-
2-fluorobiphenyl (Surrogate)	%	-	**66**	-	-
d14-p-terphenyl (Surrogate)	%	-	**92**	-	-
Trace Metals (Dissolved) in Water by ICPMS Method: AN318					
Arsenic, As	µg/L	1	**17**	**2**	-
Cadmium, Cd	µg/L	0.1	**0.1**	**0.2**	-
Chromium, Cr	µg/L	1	**37**	**2**	-
Copper, Cu	µg/L	1	**1**	**1**	-
Lead, Pb	µg/L	1	**4**	<1	-
Nickel, Ni	µg/L	1	**10**	**4**	-
Zinc, Zn	µg/L	5	**110**	<5	-
Mercury (dissolved) in Water Method: AN311/AN312					
Mercury	mg/L	0.0001	<0.0001	<0.0001	-

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury (dissolved) in Water **Method: ME-(AU)-[ENV]AN311/AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB073717	mg/L	0.0001	<0.0001	0%	104%	91%

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Naphthalene	LB073515	µg/L	0.1	<0.1	84%
2-methylnaphthalene	LB073515	µg/L	0.1	<0.1	NA
1-methylnaphthalene	LB073515	µg/L	0.1	<0.1	NA
Acenaphthylene	LB073515	µg/L	0.1	<0.1	106%
Acenaphthene	LB073515	µg/L	0.1	<0.1	110%
Fluorene	LB073515	µg/L	0.1	<0.1	NA
Phenanthrene	LB073515	µg/L	0.1	<0.1	116%
Anthracene	LB073515	µg/L	0.1	<0.1	103%
Fluoranthene	LB073515	µg/L	0.1	<0.1	103%
Pyrene	LB073515	µg/L	0.1	<0.1	117%
Benzo(a)anthracene	LB073515	µg/L	0.1	<0.1	NA
Chrysene	LB073515	µg/L	0.1	<0.1	NA
Benzo(b&j)fluoranthene	LB073515	µg/L	0.1	<0.1	NA
Benzo(k)fluoranthene	LB073515	µg/L	0.1	<0.1	NA
Benzo(a)pyrene	LB073515	µg/L	0.1	<0.1	114%
Indeno(1,2,3-cd)pyrene	LB073515	µg/L	0.1	<0.1	NA
Dibenzo(a&h)anthracene	LB073515	µg/L	0.1	<0.1	NA
Benzo(ghi)perylene	LB073515	µg/L	0.1	<0.1	NA
Total PAH (18)	LB073515	µg/L	1	<1	

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB073515	%	-	108%	78%
2-fluorobiphenyl (Surrogate)	LB073515	%	-	104%	82%
d14-p-terphenyl (Surrogate)	LB073515	%	-	122%	104%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Arsenic, As	LB073572	µg/L	1	<1	102%
Cadmium, Cd	LB073572	µg/L	0.1	<0.1	97%
Chromium, Cr	LB073572	µg/L	1	<1	101%
Copper, Cu	LB073572	µg/L	1	<1	101%
Lead, Pb	LB073572	µg/L	1	<1	100%
Nickel, Ni	LB073572	µg/L	1	<1	101%
Zinc, Zn	LB073572	µg/L	5	<5	104%

TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB073515	µg/L	50	<50	93%
TRH C15-C28	LB073515	µg/L	200	<200	95%
TRH C29-C36	LB073515	µg/L	200	<200	97%
TRH C37-C40	LB073515	µg/L	200	<200	NA
TRH C10-C36	LB073515	µg/L	450	<450	NA
TRH C10-C40	LB073515	µg/L	650	<650	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH >C10-C16 (F2)	LB073515	µg/L	60	<60	94%
TRH >C16-C34 (F3)	LB073515	µg/L	500	<500	96%
TRH >C34-C40 (F4)	LB073515	µg/L	500	<500	100%

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

Fumigants

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
2,2-dichloropropane	LB073651	µg/L	0.5	<0.5	NA
1,2-dichloropropane	LB073651	µg/L	0.5	<0.5	NA
cis-1,3-dichloropropene	LB073651	µg/L	0.5	<0.5	NA
trans-1,3-dichloropropene	LB073651	µg/L	0.5	<0.5	NA
1,2-dibromoethane (EDB)	LB073651	µg/L	0.5	<0.5	NA

Halogenated Aliphatics

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorodifluoromethane (CFC-12)	LB073651	µg/L	5	<5	NA
Chloromethane	LB073651	µg/L	5	<5	NA
Vinyl chloride (Chloroethene)	LB073651	µg/L	0.3	<0.3	NA
Bromomethane	LB073651	µg/L	10	<10	NA
Chloroethane	LB073651	µg/L	5	<5	NA
Trichlorofluoromethane	LB073651	µg/L	1	<1	NA
Iodomethane	LB073651	µg/L	5	<5	NA
1,1-dichloroethene	LB073651	µg/L	0.5	<0.5	98%
Dichloromethane (Methylene chloride)	LB073651	µg/L	5	<5	NA
Allyl chloride	LB073651	µg/L	2	<2	NA
trans-1,2-dichloroethene	LB073651	µg/L	0.5	<0.5	NA
1,1-dichloroethane	LB073651	µg/L	0.5	<0.5	NA
cis-1,2-dichloroethene	LB073651	µg/L	0.5	<0.5	NA
Bromochloromethane	LB073651	µg/L	0.5	<0.5	NA
1,2-dichloroethane	LB073651	µg/L	0.5	<0.5	97%
1,1,1-trichloroethane	LB073651	µg/L	0.5	<0.5	NA
1,1-dichloropropene	LB073651	µg/L	0.5	<0.5	NA
Carbon tetrachloride	LB073651	µg/L	0.5	<0.5	NA
Dibromomethane	LB073651	µg/L	0.5	<0.5	NA
Trichloroethene (Trichloroethylene,TCE)	LB073651	µg/L	0.5	<0.5	100%

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOCs in Water **Method: ME-(AU)-[ENV]AN433/AN434 (continued)**

				MB	LCS %Recovery
1,1,2-trichloroethane	LB073651	µg/L	0.5	<0.5	NA
1,3-dichloropropane	LB073651	µg/L	0.5	<0.5	NA
Tetrachloroethene (Perchloroethylene,PCE)	LB073651	µg/L	0.5	<0.5	NA
1,1,1,2-tetrachloroethane	LB073651	µg/L	0.5	<0.5	NA
cis-1,4-dichloro-2-butene	LB073651	µg/L	1	<1	NA
1,1,2,2-tetrachloroethane	LB073651	µg/L	0.5	<0.5	NA
1,2,3-trichloropropane	LB073651	µg/L	0.5	<0.5	NA
trans-1,4-dichloro-2-butene	LB073651	µg/L	1	<1	NA
1,2-dibromo-3-chloropropane	LB073651	µg/L	0.5	<0.5	NA
Hexachlorobutadiene	LB073651	µg/L	0.5	<0.5	NA

Halogenated Aromatics

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Chlorobenzene	LB073651	µg/L	0.5	<0.5	100%
Bromobenzene	LB073651	µg/L	0.5	<0.5	NA
2-chlorotoluene	LB073651	µg/L	0.5	<0.5	NA
4-chlorotoluene	LB073651	µg/L	0.5	<0.5	NA
1,3-dichlorobenzene	LB073651	µg/L	0.5	<0.5	NA
1,4-dichlorobenzene	LB073651	µg/L	0.3	<0.3	NA
1,2-dichlorobenzene	LB073651	µg/L	0.5	<0.5	NA
1,2,4-trichlorobenzene	LB073651	µg/L	0.5	<0.5	NA
1,2,3-trichlorobenzene	LB073651	µg/L	0.5	<0.5	NA

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB073651	µg/L	0.5	<0.5	97%
Toluene	LB073651	µg/L	0.5	<0.5	100%
Ethylbenzene	LB073651	µg/L	0.5	<0.5	100%
m/p-xylene	LB073651	µg/L	1	<1	100%
o-xylene	LB073651	µg/L	0.5	<0.5	100%
Styrene (Vinyl benzene)	LB073651	µg/L	0.5	<0.5	NA
Isopropylbenzene (Cumene)	LB073651	µg/L	0.5	<0.5	NA
n-propylbenzene	LB073651	µg/L	0.5	<0.5	NA
1,3,5-trimethylbenzene	LB073651	µg/L	0.5	<0.5	NA
tert-butylbenzene	LB073651	µg/L	0.5	<0.5	NA
1,2,4-trimethylbenzene	LB073651	µg/L	0.5	<0.5	NA
sec-butylbenzene	LB073651	µg/L	0.5	<0.5	NA
p-isopropyltoluene	LB073651	µg/L	0.5	<0.5	NA
n-butylbenzene	LB073651	µg/L	0.5	<0.5	NA

Nitrogenous Compounds

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Acrylonitrile	LB073651	µg/L	0.5	<0.5	NA

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Acetone (2-propanone)	LB073651	µg/L	10	<10	NA
MtBE (Methyl-tert-butyl ether)	LB073651	µg/L	2	<1	NA
Vinyl acetate	LB073651	µg/L	10	<10	NA
MEK (2-butanone)	LB073651	µg/L	10	<10	NA
MIBK (4-methyl-2-pentanone)	LB073651	µg/L	5	<5	NA
2-hexanone (MBK)	LB073651	µg/L	5	<5	NA

Polycyclic VOCs

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOCs in Water **Method: ME-(AU)-[ENV]AN433/AN434 (continued)**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Naphthalene	LB073651	µg/L	0.5	<0.5	NA

Sulphonated Compounds

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Carbon disulfide	LB073651	µg/L	2	<2	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB073651	%	-	107%	91%
d4-1,2-dichloroethane (Surrogate)	LB073651	%	-	104%	94%
d8-toluene (Surrogate)	LB073651	%	-	98%	92%
Bromofluorobenzene (Surrogate)	LB073651	%	-	96%	98%

Totals

Parameter	QC Reference	Units	LOR	MB
Total Xylenes	LB073651	µg/L	1.5	<1.5
Total BTEX	LB073651	µg/L	3	<3

Trihalomethanes

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Chloroform (THM)	LB073651	µg/L	0.5	<0.5	96%
Bromodichloromethane (THM)	LB073651	µg/L	0.5	<0.5	NA
Dibromochloromethane (THM)	LB073651	µg/L	0.5	<0.5	NA
Bromoform (THM)	LB073651	µg/L	0.5	<0.5	NA

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C6-C10	LB073651	µg/L	50	<50	100%
TRH C6-C9	LB073651	µg/L	40	<40	94%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB073651	%	-	109%	97%
d4-1,2-dichloroethane (Surrogate)	LB073651	%	-	107%	99%
d8-toluene (Surrogate)	LB073651	%	-	100%	94%
Bromofluorobenzene (Surrogate)	LB073651	%	-	89%	95%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene (F0)	LB073651	µg/L	0.5	<0.5	NA
TRH C6-C10 minus BTEX (F1)	LB073651	µg/L	50	<50	102%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
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, dependant 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	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/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.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
^	Performed by outside laboratory.	NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

APPENDIX F
QA/QC Assessment

F1 QUALITY CONTROL PROGRAM

F1.1 INTRODUCTION

For the purpose of assessing the quality of data presented in this DSI 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 F-1.

Table F-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 and Trip Spike (laboratory prepared) Laboratory – Method blank	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Completeness	Completion (%)	-

F1.2 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.

F2 FIELD QA/QC DATA EVALUATION

F2.1 SOIL INVESTIGATION

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

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

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

F2.1.1 Blind Field Duplicate & Inter Laboratory Duplicate

Two (2) blind field duplicate (BFD) samples, being samples B200 and B201, were collected from the primary samples BH205-1 and BH207-2 respectively. 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 and selected heavy metals with the RPD values calculated found to be within the Data Acceptance Criteria, with the exception of arsenic for primary sample BH205-1 (66.67%) and lead (100%), mercury (176.47%), nickel (51.43%) and zinc (53.33%) for primary sample 207-2 (Appendix H, Table QC5).

F2.1.2 Inter Laboratory Duplicate

One (1) inter laboratory duplicate (ILD) sample, being sample I200, was collected from the primary sample BH105-1. 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 (Appendix H, Table QC5), with the exception of fraction F3 (94.12%), arsenic (52.63%), cadmium (80%), chromium (57.14%), copper (93.58%), mercury (100%), nickel (88%) and zinc (140.23%) indicating that the RPDs for the samples were found to be higher than the expected range for homogenous soils. These exceedances are likely to be indicative of a non-homogenous fill material.

Soil samples were placed immediately into jars following sampling to reduce the loss of volatiles from samples. Results of soil sampling indicate that the samples collected are representative of soils at respective sampling locations.

F2.1.3 Trip Blank

One trip blank (TB) sample, 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.

F2.1.4 Rinsate Blank

One rinsate blank (RB) sample was submitted to the primary laboratory for TRH, BTEX and selected heavy metals analysis. The RB sample results were reported below the laboratory LOR, with the exception of zinc which was reported 36µg/L. Further investigation to this concentration revealed that the laboratory prepared water used for the rinsate sample had been prepared with the incorrect water.

Overall, it was concluded that decontamination procedures performed during the field works had been effective.

F2.2 GROUNDWATER INVESTIGATION

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

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

The results of the QA/QC samples collected during the groundwater investigation, including the calculated RPD values between primary and duplicate samples, are presented in Table F-3.

F2.2.1 Blind Field Duplicate

One blind field duplicate (BFD) sample, being sample QD1, was collected from the primary sample MW201. The preparation of the BFD sample 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 TRH, BTEX and selected heavy metals. The RPD values calculated for the all of the tested analytes were found to be within the Data Acceptance Criteria (DAC).

F2.2.2 Inter-Laboratory Duplicate

One inter-laboratory duplicate (ILD) sample, being sample QT1, was collected from the primary sample MW201. The preparation of the ILD sample was identical to the BFD sample as described above and analysed for TRH, BTEX and selected heavy metals. The RPD values calculated for the ILD sample were found to be within the Data Acceptance Criteria, with the exception of a single exceedance in fraction F1 (194.74%).

F2.2.3 Assessment of Field QA/QC Data

All soil samples were classified in the field with respect to soil/fill characteristics and 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.

Based on the results of the field QA/QC data, EI considered the field QA/QC programme carried out during the investigation works to be appropriate and the results to be generally acceptable.

F3 LABORATORY QA/QC

F1 QUALITY CONTROL PROGRAM

F1.1 INTRODUCTION

For the purpose of assessing the quality of data presented in this DSI 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 F-1.

Table F-2 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 and Trip Spike (laboratory prepared) Laboratory – Method blank	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Completeness	Completion (%)	-

F1.2 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.

F2 FIELD QA/QC DATA EVALUATION

F2.1 SOIL INVESTIGATION

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

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

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

F2.1.1 Blind Field Duplicate

One blind field duplicate (BFD) sample, being sample QD1, was collected from the primary sample BH6_0.5-0.7. 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 and selected heavy metals with the RPD values calculated found outside the DAC to be the following:

- Arsenic (147.06%)
- Lead (146.99%)
- Nickel (65.45%)
- Zinc (59.26%)
- F3 (76.47%)
- Toluene (66.67%)

This indicates that the RPDs for the samples were found to be higher than the expected range for homogenous soils. These exceedances are likely to be indicative of a non-homogenous fill material.

Soil samples were placed immediately into jars following sampling to reduce the loss of volatiles from samples. Results of soil sampling indicate that the samples collected are representative of soils at respective sampling locations (Appendix G, Table QC5).

F2.1.2 Inter Laboratory Duplicate

One inter laboratory duplicate (ILD) sample, being sample QT1, was collected from the primary sample BH6_0.5-0.7. 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 BFD was analysed for TPH, BTEX and selected heavy metals with the RPD values calculated found to be within the Data Acceptance Criteria (DAC).

F2.1.3 Trip Blank

One trip blank (TB1) sample was analysed for BTEX by the primary laboratory. The soil TB1 sample results were reported below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.

F2.1.4 Rinsate Blank

One rinsate blank (RB) sample was submitted to the primary laboratory for TRH, BTEX and selected heavy metals analysis. The RB sample results were reported below the laboratory LOR, with the exception of zinc which was reported 79µg/L. Further investigation to this concentration revealed that the laboratory prepared water used for the rinsate sample had been prepared with the incorrect water.

Overall, it was concluded that decontamination procedures performed during the field works had been effective.

F2.2 GROUNDWATER INVESTIGATION

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

- Blind field duplicate;
- Trip blank; and

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

F2.2.1 Blind Field Duplicate

One blind field duplicate (BFD) sample, being sample GWQD1, was collected from the primary sample MW1. The preparation of the BFD sample 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 with the RPD values calculated found outside the DAC to be the following:

- Arsenic (157.89%)
- Cadmium (66.67%)
- Chromium (147.49%)
- Nickel (85.71%)

This indicates that the RPDs for the samples were found to be higher than the expected range for homogenous groundwater. These exceedances are likely influenced by matrix interference (high turbidity remained after field filtering) as reported in lab results.

F2.2.2 Assessment of Field QA/QC Data

All soil samples were classified in the field with respect to soil/fill characteristics and 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.

Based on the results of the field QA/QC data, EI considered the field QA/QC programme carried out during the investigation works to be appropriate and the results to be generally acceptable.

F3 LABORATORY QA/QC

F3.1 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.

F3.2 SAMPLE HOLDING TIMES

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

F3.3 TEST METHODS AND PRACTICAL QUANTITATION LIMITS (PQLS)

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

F3.4 METHOD BLANKS

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

F3.5 LABORATORY DUPLICATE SAMPLES

All Laboratory Duplicate Samples for the analysis batches were within acceptable ranges and conformed to the DAC with the exception of PAHs and nickel in soils reported as due to either sample heterogeneity or low concentrations.

F3.6 LABORATORY CONTROL SAMPLES

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

F3.7 MATRIX SPIKES

The matrix spikes of the analysis batches were within acceptable ranges and conformed to the DAC.

F3.8 SURROGATE

The recovery of surrogates conformed to the DAC.

Sample identification	Description	TRH				BTEX						Heavy Metals							
		F1*	F2**	F3 (>C_{16} - C_{34})	F4 (>C_{34} - C_{40})	Benzene	Toluene	Ethylbenzene	Xylene (total)	m/p-xylene	o-xylene	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate																			
BH6_0.5-0.7	Gravelly SAND	<25	<25	210	<120	<0.1	0.1	<0.1	<0.3	<0.2	<0.1	9	0.5	7.7	30	110	0.51	3.7	140
QD1	Replicate of BH6_0.5-0.7	<25	<25	470	<120	<0.1	0.2	<0.1	<0.3	<0.2	<0.1	59	<0.3	10	29	720	0.82	7.3	76
RPD		*0.00*	*0.00*	76.47	*0.00*	*0.00*	66.67	*0.00*	*0.00*	*0.00*	*0.00*	147.06	61.54	*25.99*	*3.39*	146.99	*46.62*	65.45	59.26
MW1	Groundwater	<2500	62	3500	570	<25	<25	<25	<75	<50	<25	17	0.1	37	1	4	<0.1	10	110
GWQD1	Replicate of MW1	<2500	<60	4600	<500	<25	<25	<25	<75	<50	<25	2	0.2	2	1	<1	<0.1	4	<5
RPD		*0.00*	*4.35*	*27.16*	*17.07*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	157.89	66.67	179.49	*0.00*	133.33	*0.00*	85.71	186.67
Inter-laboratory Duplicate																			
BH6_0.5-0.7	Gravelly SAND	<25	<25	210	<120	<0.1	0.1	<0.1	<0.3	<0.2	<0.1	9	0.5	7.7	30	110	0.51	3.7	140
QT1	Replicate of BH6_0.5-0.7	<25	<50	130	<100	<0.2	<0.5	<1	<3	<2	<1	11.0	<0.4	10	26	180	0.4	5	110
RPD		*0.00*	*NA*	*47.06*	*NA*	*NA*	228.57	*NA*	*NA*	*NA*	*NA*	*20.00*	*28.57*	*25.99*	*14.29*	*48.28*	*24.18*	*29.89*	*24.00*
Trip Blanks																			
TB1	Trip Blank - Soils	-	-	-	-	<0.1	<0.1	<0.1	<0.3	<0.2	<0.1	-	-	-	-	-	-	-	-
GWQTB1	Trip Blank - Groundwater	-	-	-	-	<0.5	<0.5	<0.5	<1.5			-	-	-	-	-	-	-	-
Rinsate Blanks																			
RB1	De-ionised water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.5	<1	<0.1	<1	<1	<1	<0.1	<1	79

52.17 Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.

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

NOTE:

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

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

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

APPENDIX G
Laboratory QA/QC Policies and DQOs

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
Parameter	Container	Preservation	Maximum Holding Time
Acid digestible metals and metalloids - Total and TCLP (As,Cd.,Cu,Cr,Ni,Pb,Zn)	Glass with Teflon Lid	Nil	6 months
Mercury	Glass with Teflon Lid	Nil	28 days
TPH / BTEX / VOC / SVOC / CHC	Glass with Teflon Lid	4°C, zero headspace	14 days
PAHs (total and TCLP)	Glass with Teflon Lid	4°C [1]	14 days
Phenols	Glass with Teflon Lid	4°C [1]	14 days
OCPs, OPPs and total PCBs	Glass with Teflon Lid	4°C [1]	14 days
Asbestos	Sealed Plastic Bag	Nil	N/A

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
Parameter	Container Volume (mL)	Preservation	Maximum Holding Time
Heavy Metals	125mL Plastic	Field filtration 0.45μm HNO_3 / 4°C	6 months
Cyanide	125mL Amber Glass	pH > 12 NaOH / 4°C	6 months
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 43mL Glass	HCl / 4°C [1]	14 days
TPH (C10-C36) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4°C [1]	28 days

Notes: [1] = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As[1]	mg / kg	1	USEPA 200.7
Cadmium - Cd[1]	mg / kg	0.5	USEPA 200.7
Chromium - Cr[1]	mg / kg	1	USEPA 200.7
Copper - Cu[1]	mg / kg	1	USEPA 200.7
Lead - Pb[1]	mg / kg	1	USEPA 200.7
Mercury - Hg[2]	mg / kg	0.1	USEPA 7471A
Nickel - Ni[1]	mg / kg	1	USEPA 200.7
Zinc - Zn[1]	mg / kg	1	USEPA 200.7
Total Petroleum Hydrocarbons (TPHs) in Soil			
C_6-C_9 fraction	mg / kg	25	USEPA 8260
C_{10}-C_{14} fraction	mg / kg	50	USEPA 8000
C_{15}-C_{28} fraction	mg / kg	100	USEPA 8000
C_{29}-C_{36} fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	1	USEPA 8260
Toluene	mg / kg	1	USEPA 8260
Ethylbenzene	mg / kg	1	USEPA 8260
m & p Xylene	mg / kg	2	USEPA 8260
o- Xylene	mg / kg	1	USEPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05-0.2	USEPA 8270
CHCs	mg / kg	1	USEPA 8260
VOCs	mg / kg	1	USEPA 8260
SVOCs	mg / kg	1	USEPA 8260
OCPs	mg / kg	0.1	USEPA 8140, 8080
OPPs	mg / kg	0.1	USEPA 8140, 8080
PCBs	mg / kg	0.1	USEPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS4964-2004

Notes:

1. Acid Soluble Metals by ICP-AES
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method
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	0.5	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	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 (TPHs)			
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
BTEX			
Benzene	µg/L	1	USEPA 8220A
Toluene	µg/L	1	USEPA 8220A
Ethylbenzene	µg/L	1	USEPA 8220A
m- & p-Xylene	µg/L	2	USEPA 8220A
o-Xylene	µg/L	1	USEPA 8220A
Polyciclic Aromatic Hydrocarbons (PAHs)			
PAHs	µg/L	0.1	USEPA 8270
Benzo(a)pyrene	µg/L	0.01	USEPA 8270
OrganoChlorine Pesticides (OCPs)			
Aldrin	µg/L	0.001	USEPA 8081
Chlordane	µg/L	0.001	USEPA 8081
DDT	µg/L	0.001	USEPA 8081
Dieldrin	µg/L	0.001	USEPA 8081
Endosulfan	µg/L	0.001	USEPA 8081
Endrin	µg/L	0.001	USEPA 8081
Heptachlor	µg/L	0.001	USEPA 8081
Lindane	µg/L	0.001	USEPA 8081
Toxaphene	µg/L	0.001	USEPA 8081

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
1,2-dichlorobenzene	µg/L	1	USEPA 8260B
1,3-dichlorobenzene	µg/L	1	USEPA 8260B
1,4-dichlorobenzene	µg/L	1	USEPA 8260B
1,2,3-trichlorobenzene	µg/L	1	USEPA 8260B
1,2,4-trichlorobenzene	µg/L	1	USEPA 8260B
Hexachlorobutadeine	µg/L	1	USEPA 8260B
1,1,2-trichloroethane	µg/L	1	USEPA 8260B
Hexachloroethane	µg/L	10	USEPA 8270D
Other CHCs	µg/L	1	USEPA 8260B
Volatile Organic Compounds (VOCs)			
Aniline	µg/L	10	USEPA 8260B
2,4-dichloroaniline	µg/L	10	USEPA 8260B
3,4-dichloroaniline	µg/L	10	USEPA 8260B
Nitrobenzene	µg/L	50	USEPA 8260B
2,4-dinitrotoluene	µg/L	50	USEPA 8260B
2,4,6-trinitrotoluene	µg/L	50	USEPA 8260B
Phenolic Compounds			
Phenol	µg/L	10	USEPA 8041
2-chlorophenol	µg/L	10	USEPA 8041
4-chlorophenol	µg/L	10	USEPA 8041
2, 4-dichlorophenol	µg/L	10	USEPA 8041
2,4,6-trichlorophenol	µg/L	10	USEPA 8041
2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8041
Pentachlorophenol	µg/L	10	USEPA 8041
2,4-dinitrophenol	µg/L	10	USEPA 8041
Miscellaneous Parameters			
Total Cyanide	µg/L	5	APHA 4500C&E-CN
Fluoride	µg/L	10	APHA 4500 F-C
Salinity (TDS)	mg/L	1	APHA 2510
pH	units	0.1	APHA 4500H+
OrganoPhosphate Pesticides (OPPs)			
Azinphos Methyl	µg/L	0.01	USEPA 8141
Chloropyrifos	µg/L	0.01	USEPA 8141
Diazinon	µg/L	0.01	USEPA 8141
Dimethoate	µg/L	0.01	USEPA 8141
Fenitrothion	µg/L	0.01	USEPA 8141
Malathion	µg/L	0.01	USEPA 8141
Parathion	µg/L	0.01	USEPA 8141
Temephos	µg/L	0.01	USEPA 8141
Polychlorinated Biphenyls (PCBs)			
Individual PCBs	µg/L	0.01	USEPA 8081

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	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.	Lab Duplicate RPD < 15% (Inorganics) Lab Duplicate RPD < 30% (Organics) for sample results > 10 LOR
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. $\%\ Recovery = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.	at least 2 SS recoveries to be within 70-130% subject to matrix effects (Organics) 80-120% (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)
Calibration Check Standars	Continuous Calibration Verification (CCV)	CCV must be within ±15% (inorganics) CCV must be within ±25% (inorganics)
Reagent, Method & Calibration Check Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL

Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte.
LOR = Limit of Reporting

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