Attachment AC

Stage 1 Environmental Site Assessment

STAGE 1 ENVIRONMENTAL SITE ASSESSMENT

Canberra Brickworks Remediation Project
Block 1 Section 102 Yarralumla
Canberra Central ACT

February 2015 (Revised March 2015)



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EXECUTIVE SUMMARY

Capcorp Constructions Pty Ltd (Capcorp) has engaged Robson Environmental Pty Ltd (Robson) to undertake an Environmental Site Assessment (ESA) which required the removal of surface vegetation and exposed asbestos material (preliminary remedial works) prior to the commencement of ESA investigative works. The remedial works formed a part of the Stage 1 works presented in the Remediation Action Plan (RAP) (Robson Reference 9623_EAR_RAP_Ver 4_20140730.docx) for the remediation of the asbestos dump ('AD') and associated impacted soil.

Based on the current understanding of the area of impact, the majority of the Asbestos Dump ('AD') is located in the centre of the western boundary of the Canberra Brickworks site, Block 1 Section 102 Yarralumla ACT 2600 (Canberra Central) Denman Street, Yarralumla ACT 2600 (herein referred to as 'the site'). However, the western side of the dump encroaches on the adjoining block(s), Public Land, Block 20 Section 102 and possibly Block 1 Section 127 Yarralumla.

The objective of the Stage 1 ESA was twofold, to determine the type of contamination and it's extent within the understood area of the 'AD' for the determination of the appropriate remedial method for the site; and to assess the site (from a contamination perspective) for the redevelopment for high density residential land use Health Investigation Level 'B' (HIL B) as defined by the National Environment Protection Council 1999 – National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (amended version May 2013), herein referred to as the ASC NEPM 2013.

This ESA was based on the Robson 9 September 2014 '*Sample Analysis Quality Plan – Canberra Brickworks Remediation Project'* (Robson Reference: 9623_EAR_SAQP_20140916.docx) and was prepared to guide the assessment of the 'AD' with the objective to remove gross asbestos contamination from the surface of the 'AD' and to improve on it's characterisation. This information would then be used to refine the RAP which should increase the confidence that the appropriate remediation strategy for the 'AD' is selected for the Stage 2 remediation works to affect the site remediation goals. .

<u>Stage 1 ESA</u>

The Stage 1 ESA also included preliminary remedial site works which comprised of site set up, vegetation and asbestos removal. These works commenced on 17 November 2014 and were undertaken by AAC Environmental and their sub-contractor Irwin and Hartshorn Pty Ltd. The removal of the vegetation commenced on 21 November and included the removal of surface asbestos materials and visibly impacted asbestos soils. While the vegetation removal was completed on 1 December 2014 the asbestos containing material (ACM) removal continued and was completed on 8 December 2014.

Following the removal of the vegetation and the asbestos containing materials (ACM) from the surface, the ESA works were able to be undertaken with minimal risk to the investigative team.

The ESA works (test pit sampling) occurred between the 4 and the 11 December 2014, while the north to south trenching work connecting the test pits was undertaken on 12 December 2014.

The ESA works included the excavation of twenty five (25) grid based sample locations with an excavator to a target depth of 0.5 m into the natural soil horizon where possible across the site ('AD'). Of the 25, 16 locations were within the understood boundary of the 'AD' while six (6) were located down gradient within the drainage line outside the 'AD' and three (3) up gradient on the east side of the 'AD' outside the mounded vegetated area.

On completion of the test pit and sampling work four (4) north – south trenches were excavated with the aim of joining the test pits to investigate whether fill between the test pits was significantly different. On average the trenches were between two (2) and three (3) metres deep.

Following the completion of the ESA works the stockpiled vegetation was wood chipped on 15 December 2014 under the supervision of AAC who are an ACT licensed asbestos removalist. On the 16 December soil that had been disturbed was sealed with a bituminous sealant by Capcorp and the woodchips were subsequently redistributed by AAC across the surface to enhance the stabilisation of the surface prior to the anticipated commencement of the Stage 2 remedial works scheduled for later in 2015.

Field observations and the results of the laboratory analysis for the site identified asbestos sheet materials in test pits TP3, TP5, TP6, TP8 and TP13. Friable asbestos, Fibrous Asbestos (FA) and Asbestos Fines (AF) were identified in test pits TP8 and TP13. Low concentrations of Total Recoverable Hydrocarbons (TRH) and Polycyclic Aromatic Hydrocarbons were detected at test pit locations TP8, TP11 and TP13. Concentrations only exceeded the assessment criteria for Benzo (a) Pyrene (BaP TEQ) (4mg/kg) at TP13 (0.0 - 0.1m) exhibiting a concentration of 15 mg/kg. Similar concentrations of BaP TEQ were not detected at depth in this location while low concentrations of TRH were detected to a depth of 3 mbgl but were well below the assessment criteria and were not considered to be of concern.

All other contaminants of concern returned concentrations below the assessment criteria. Concentrations of lead and nickel concentrations were elevated in some locations and would require leachate analysis if the waste materials were to be disposed of to an ACT licensed landfill. However, if all material was to be disposed of to the West Belconnen Resource Management Centre (WBRMC) as asbestos waste, leachate analysis would not be required as the metal concentrations do not exceed the Commercial and Industrial land use assessment criteria which are applicable to the land use criteria set for WBRMC.

The principal contaminant of the concern is asbestos. Based on the results of the assessment, the asbestos is predominantly located in the central and southeast portion of the dump. The depth of the asbestos ranged from 0.5 metres below ground level (mbgl) at TP3 to a depth of 3.2 mbgl at TP13. Based on this information the asbestos impacted fill is confined to the upper layer within this area and is expected to occur at varying concentrations within the fill. The fill across the site covers a greater area than the asbestos contamination. Based on field observations the fill that is asbestos impacted has a high concentration of mixed-waste that

includes soil, brick, tile, metal, glass, wood, ash and slag while the fill that does not appear to contain asbestos is dominated by brick, ceramic tile with some ash and slag. Based on these observations the asbestos is confined to the surface layer of the fill within a 1,260 square metre (m^2) area of the 'AD' while the fill covers a much larger area (3,722 m^2) and is likely to extend beyond the visible boundary of the 'AD' extending toward north and east of the site toward a Lane Poole Place and the Brickwork buildings. Therefore, based on the survey data collected during the assessment the estimated volumes specific to the 'AD' of asbestos waste is 2,610.1 cubic metres (m^3) while the estimated total volume of fill soil (soil, brick, tile, glass, metal ash and slag) including the asbestos is 8,732 m^3. These figures equate to a 4,854.8 t and 16,242 t respectively when using a clay density of 1.86 t/m^3 as referenced from the Australasian Institute of Mining and Metallurgy (1995) '*Field Geologist Manual'* and do not include the fill identified around TP22 and TP23 primarily because these locations are considered to be outside the 'AD'.

However, it must be noted that the derivation of these figures is based on field observations and interpolation between data points so a degree of uncertainty must be considered. If one extends the ACM fill boundary half way between the outlying unimpacted test pits the approximate area is 2,700 m^2 and assuming an average depth of 1.5 mbgl the volume of ACM fill could be as high as 4,050 m^3 which equates to approximately 7,533 t.

Based on this information Robson recommends that the data collected and assessed in this report is suitable for the refinement of the proposed Stage 2 remedial works as proposed in the current Remediation Action Plan (RAP) with the objective of rendering the site suitable for high density residential land use as defined by the '*National Environment Protection (Assessment of Site Contamination) Measure'* (NEPM as amended, May 2013).

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND MUST BE READ IN CONJUNCTION WITH THE REPORT TERMS AND CONDITIONS INCLUDED AFTER THE ABBREVIATIONS SECTION IN THIS REPORT.

1 INTRODUCTION

1.1 Background

Capcorp Constructions Pty Ltd (Capcorp) has engaged Robson Environmental Pty Ltd (Robson) to undertake an Environmental Site Assessment (ESA) which required the removal of surface vegetation and exposed asbestos material (preliminary remedial works) prior to the commencement of ESA investigative works. The remedial works formed a part of the Stage 1 works presented in the Remediation Action Plan (RAP) titled *'Remediation Action Plan, Stage 1 and 2 (Includes Hazardous Materials) Canberra Brickworks Remediation Project Downer Block 1 Section 102, Yarralumla Canberra Central ACT'* (Robson Reference 9623_EAR_RAP_Ver 4_20140730.docx) for the remediation of the asbestos dump ('AD') and associated impacted soil.

Based on the current understanding of the area of impact, the majority of the 'Asbestos Dump' 'AD' is located in the centre of the western boundary of the Canberra Brickworks site, Block 1 Section 102 Yarralumla ACT 2600 (Canberra Central) Denman Street Yarralumla ACT 2600 (herein referred to as 'the site'). However, the western side of the dump encroaches on the adjoining block(s), Public Land, Block 20 Section 102 and possibly Block 1 Section 127 Yarralumla. A site location plan and a detailed site plan are presented in **Figure 1**, **Figure 2** and **Figure 3.**

This report documents the scope of work and the results of the ESA, including the removal of vegetation, the accessible surface asbestos containing material (ACM) and the assessment of the vertical and horizontal extent of the 'AD'.

Based on the previous environmental assessment reports undertaken in 2001 and later in 2007 it was recorded that asbestos contamination was present in the area of the 'AD'. The findings of the previous assessment work are presented in the reports referenced below:

- Connell and Wagner 2001 - *Appendix F-Brickworks Contamination Report*;
- Robson Laboratories Pty Ltd (October 2006) '*Environmental Investigation – Audit Report Yarralumla Brickworks Block 1 Section 102 Yarralumla Canberra Central ACT.* (Robson reference 3144_ CL_EI Final_20061018).

The findings from these assessments triggered the need to consider the remediation of the AD to allow the safe reuse of the impacted land.

The Stage 1 ESA works were undertaken in general accordance with the ACT EPA legislation and the ACT EPA endorsed guidelines made or approved by the EPA under the *ACT Environment Protection Act 1997* including the NSW Office of Environment and Heritage (OEH, 2011) *'Guidelines for Consultants Reporting on Contaminated Sites.'*

The Stage 1 ESA has been prepared in accordance with the '*National Environment Protection (Assessment of Site Contamination) Measure'* (NEPM as amended, May 2013) and the NSW Department of Environment and Conservation (DEC, 2006) '*Guidelines for the NSW Site Auditor Scheme (2nd Edition)*' and was it's implementation was based on the Robson (2014) '*Sample Analysis Quality Plan –*

Canberra Brickworks Remediation Project' (Robson Reference: 9623_EAR_SAQP_20140916.docx).

The relevant legislation, regulations, and guidelines are listed below:

- ACT Environment Protection Act 1997;
- ACT EPA (2009) '*Contaminated Sites – Environment Protection Policy*';
- Australian Standard AS 4482.1-2005 '*Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds*';
- ACT ESDD (2014) Contaminated Sites Information Sheet 4 '*Requirements for the Re-Use and Disposal of Contaminated Soil*';
- ACT ESDD (2014) Contaminated Sites Information Sheet No. 5 '*Requirements for the Transport and Disposal of Asbestos Contaminated Wastes*';
- ACT ESDD (2014) Contaminated Sites Information Sheet No. 6 '*Management of Small Scale, Low Risk Soil Asbestos Contamination*';
- Environment ACT (2000) '*Environmental Guidelines: Assessment & Classification of Liquid & Non-Liquid Wastes'*;
- NSW Office of Environment and Heritage (OEH, 2011) 'Guidelines for Consultants Reporting on Contaminated Sites';
- NSW EPA (1995) '*Sampling Design Guidelines*';
- National Environment Protection Council (NEPC) 1999 'National Environment Protection (Assessment of Site Contamination) Measure 1999' (amended version of 2013, herein referred to as the ASC NEPM (2013));
- WA DOH (2009) '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*' (WA Guidelines).

1.2 Objective

The objectives of the Stage 1 ESA were as follows:

- To characterise contamination (including contaminants of concern and extent) within the area of the 'AD' for the determination of an appropriate remedial method for the site;
- To assess the site (from a contamination perspective) for the redevelopment for high density residential land use in accordance with the trigger levels defined by Health Investigation Level 'B' (HIL B) the National Environment Protection Council 1999 – National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 (amended version May 2013), herein referred to as the ASC NEPM 2013.

1.3 Scope of Work

The scope of work undertaken for the ESA was as follows:

- Prepare a Site Safety Management Plan (SSMP) for the environmental works associated with the removal of vegetation, ACM and subsequent test pit sampling, trenching of soil within understood footprint of the 'AD';
- Monitor the removal of the vegetation and surface ACM to ensure works were undertaken in accordance with the RAP;
- Mobilise a suitably qualified environmental scientist and an ACT Class A Asbestos Assessor to the site to collect soil samples and provide advice related to the management of asbestos materials;
- Survey in sample points across the footprint of the 'AD' based on systematic sampling pattern;

  In accordance with Table A of the NSW EPA (1995) *'Sampling Design Guidelines*' a minimum of approximately thirteen (13) systematic sample points would be required for a site covering the combined site area of 4,500 m^2 to identify a hotspot of approximately 23.1 m diameter with 95 % confidence. In this case 15 locations are proposed within the area of impact, while seven (7) sample locations are proposed down gradient within the drainage line and three (3) up-gradient on the east side of the 'AD';

  Note: Due to a change in site conditions specifically the location of the temporary boundary fence the number of samples identified as being located down gradient within the drainage line was altered to six (6). However this did not affect the actual number of proposed sample locations as per the SAQP for this ESA.
- Connect the test pits with north - south oriented trenches to obtain a vertical and lateral profile of the 'AD' (refer **Figure 4**);
- Due to the known presence of asbestos, undertake airborne fibre monitoring to assess whether dust control measures were effective and that respirable asbestos fibres were not produced during onsite works;
- Air monitoring was undertaken in accordance with the '*Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC: 3003(2005)]'* and test certificates was National Association of Testing Authorities (NATA) endorsed;
- Verbal and written notification of air monitoring results was provided to the site foreman and other members of the project team prior to commencement of next days works;
- The test pits / trenches were dug with an excavator to a depth of 0.5 m below the boundary between landfill material and natural soil where practicable. Soil samples were collected and logged in general accordance with Robson Standard Operating Procedure (SOP) EAR-SOP009 *'Soil Sampling for Asbestos'* and EAR-SOP003 '*Soil Sampling and Logging*'. SOP003 stipulates the collection of samples at the ground surface (0.0 - 0.1 m), 0.5 - 0.6 m, 0.9 - 1.0 m and each metre thereafter, and at changes in lithological unit, or intersection of potential lenses of contamination;

- Soil samples collected for asbestos analysis were collected in general accordance with the method outlined in the WA Guideline as described below;

  A 10 litre (L) soil sample was collected and sieved through a 7 mm sieve. Identified ACM would be collected and weighed, and the asbestos concentration in soil at each location would then be calculated using the formula:

  $$\% \text{ Soil Asbestos} = \frac{\% \text{ Asbestos Content} \times \text{ACM (kg)}}{\text{Soil Volume (L)} \times \text{Soil Density (kg/L)}}$$

  To assess for Asbestos Fines (AF) at each sample location one (1) wetted 500 mL volume was collected. These samples were dispatched to a NATA accredited laboratory for analysis for asbestos in accordance with procedures outlined in Section 4.1.8 of the WA Guideline;

  On a number of occasions the soil was not be suitable for sieving and the material was manually broken up in the field to ensure ACM was not present within soil clods etc and sieved where possible. The sample taken for Fibrous Asbestos (FA) and Asbestos Fines (AF) analysis included combination of sieved and manual inspected soil/rock.

  Where the soil conditions resulted in the generation of dust (that is, in the presence of loose, dry soil) during the sampling process, the sampling location and samples were moistened with water applied as a fine mist to minimise the potential for dust generation during the sampling process;

- For contaminants other than asbestos, soil samples were collected from the centre of the excavator bucket using a new clean pair of nitrile gloves. This method minimised the risk of samples coming into contact with the excavator bucket which reduces the potential for cross-contamination between samples. Reusable sampling equipment (for example, hand trowel or dish) was washed and decontaminated between sample locations using Decon 90 and rinsed with tap water;
- The samples were placed into clean laboratory supplied sample containers and labelled with unique sample identification. The samples were then placed into an ice cooled esky immediately after collection and transported to a NATA accredited laboratory;
- A duplicate of each sample was screened in the field with a hand-held MiniRae® 2000 Photoionisation Detector (PID) for Volatile Organic Compounds (VOCs). The PID was calibrated daily prior to the commencement of works using fresh air and 100 parts per million (ppm) Isobutylene reference gas;
- For Quality Assurance and Quality Control (QA / QC) purposes, duplicate and triplicate samples was collected at a rate of one (1) per ten (10) and one (1) per twenty (20) primary samples respectively, in accordance with the AS 4482.1-2005. A rinsate sample was collected each day of sampling, and a Trip Spike and Trip Blank were included with each batch of samples that are sent. The QA / QC samples were labelled with no reference to the primary sample on either the sample container or the Chain of Custody (COC) documentation to reduce the potential for the analytical results to be biased by the laboratories;
- The primary soil and QA / QC samples were submitted to SGS and Envirolab Services which are NATA accredited laboratories under COC conditions in accordance with the proposed analytical plan (refer **Table L**). In general, a selection of samples were analysed for the contaminants commonly associated

with fill material including Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Xylene and Ethylbenzene (BTEX), Polycyclic Aromatic Hydrocarbons (PAHs), Speciated Phenols, Organochlorine Pesticides (OCPs), Polychlorinated Biphenyls (PCBs), eight (8) heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and asbestos.

- A representative number of samples were analysed for the physiochemical properties of pH, cation exchange capacity (CEC), clay content, organic carbon and iron which is required for the derivation of Ecological Investigation Levels (EILs) under the ASC NEPM (2013);
- Based on the findings of the Stage 1 ESA, this report has been prepared for Capcorp and Co in accordance with the NSW Office of Environment and Heritage (OEH, 2011) *'Guidelines for Consultants Reporting on Contaminated Sites.'*

2 SITE INFORMATION

General details regarding the site are summarised in **Table A** below.

Table A: Summary of Site Details.

Site Name	'Asbestos Dump' ('AD') – Western boundary of the Canberra Brickworks (Block 1 Section 102) and the adjoining block(s), Public Land, Block 20 Section 102 and possibly Block 1 Section 127.
Site Address	Canberra Brickworks, Denman Street, Yarralumla ACT
Title Identification	Part of Block 1 Section 102 Yarralumla, ACT Canberra Central Block 764
Site Area	The 'AD' has an area of approximately 0.45 hectares
Current Zoning	According to the ACT Territory Plan which is administered by the ACT Planning and Land Authority (ACTPLA), the site is currently zoned as Rural RZ1: SUBURBAN; CZ6: LEISURE AND ACCOMMODATION.
Current Site Use	Wholesale, retail outlet for recycled timber (Thor's Hammer)
Proposed Site Use	To be confirmed but for the purposes of this Stage 1 ESA Robson understands the proposed site use will be Residential HIL 'B'.

2.1 Site Description

The site forms a portion of the Yarralumla Brickworks and is located on the western boundary of the Brickworks. A plan of the site showing the Blocks, zones and boundary survey information is provided in **Figure 2**.

The Asbestos Dump ('AD')

The 'AD' covers an area of approximately 0.45 Hectares within the Canberra Brickworks and is secured by a lockable chain wire fence. The 'AD' is obscured by blackberry vines, deciduous trees and large pines on the southwest corner of the site. The site is bisected by a dry water course which may at one stage have been engineered as a stormwater channel.

The 'AD' is best accessed from the south end and is characterised by vegetation, obvious mounds and pits of buried waste before the dump levels out along the western boundary of the site. The boundary abuts onto a thin strip of public land (Block 1 Section 127 Yarralumla) which also shows signs of fill which is suspected to be encroachment from the 'AD' which separates it from Royal Canberra Golf Course where the stormwater drain is clearly visible. Private residential properties are present on the north side of the 'AD' on Lane Poole Place.

The visible waste in the dump includes Asbestos sheeting, metal, rubber, plastic and brick waste (refer **Appendix D** for Photographs).

The Brickworks (Excluding the 'AD')

The Canberra Brickworks site is identified as Block 1 Section 102 Yarralumla and covers 9.6 hectares approximately 4.8 km southwest of Canberra City. The site slopes to the west and is bounded by a golf course to the west and residential land in all other directions. Apart from the built up areas (Kilns etc) on the central west side of the site, large pine trees line the perimeter of brickworks.

The site is bounded by the Royal Canberra Golf course to the west, Lane Poole Place and Bentham Street to the North, Schomburgk and Woollis Street to the East and South. The site may be accessed by Denman Street at the south end and is secured by a new black iron fence.

The site has two (2) distinct areas, the west side which is defined by the kiln buildings and workshops and the east side which comprises the quarry. The quarry floor is dominated by a man made lake which was mostly dry at the time of the investigation 2006.

Large areas of the site have been filled with either quarry tailings or brick waste generated from the brick manufacturing processes.

2.2 Background

The site, the Canberra Brickworks, operated between 1913 and 1976. The manufacturing of bricks on the site may have impacted the site with a range of industrial contaminants primarily, hydrocarbons, polycyclic aromatic hydrocarbons and heavy metals. Other activities that may have caused on site contamination include the use of explosives for generating raw material for the bricks, pesticides and herbicides used to maintain the grounds and the use of hazardous materials in the construction of the buildings, for example asbestos. Since the brickworks ceased operation in the 1976 the site has been used by various lessees for commercial purposes. The current lessee is Thor's Hammer which operates a large scale recycled timber business. In the 1970s, perhaps due to on-site renovation and poor management practices the western boundary of the site was apparently used as a dump site which is the focus of this Stage 1 ESA. Based on aerial photographs, the dump becomes apparent in the 1980s. It is understood that hazardous materials (predominantly asbestos) have been dumped in this location. Also, it is thought that the origin of some of the asbestos waste may have been from external sources.

In August 2006 an Environmental Investigation (Audit) was undertaken by Robson Laboratories Pty Ltd of the Canberra Brickworks Site and was based on the results of an investigation by Connell Wagner Contamination Report (2001) which identified potential on-site Areas of Environmental Concern (AEC). The aim of the Audit was to gather indicative information with regard to known Areas of Environmental Concern at the Brickworks and was not specific to the assessment of the 'AD'. As a consequence shallow drilling was undertaken on the eastern boundary of the 'AD' for environmental sampling purposes and no industrial contaminants were detected in the soil at concentrations above the sensitive land use criteria (Residential 'HIL A' Land Use). The sensitive land use criteria were applied in this Audit to allow flexibility for future land use.

In early 2007 a RAP was prepared by Robson Laboratories Pty Ltd. The project was halted as the ACT Planning and Land Authority (ACTPLA) determined that Development Approval would be required for a remedial project of this size and the perceived likely increase in cost associated with the volume of asbestos materials observed in the dump following the removal of vegetation cover.

A consequence of the partial implementation of the RAP in 2007 was soil samples were able to be taken from within the dump. The analytical results further demonstrated that the likely dominant contaminant of concern was asbestos.

These environmental assessments are further discussed in **Section 3** of this report.

2.3 Heritage

This Stage 1 ESA has been designed in consultation with ACT Heritage Council as it is known that the Yarralumla Brickworks Site is listed on the ACT Heritage Register under the ACT Heritage Act 2004. The heritage items (buildings) have been identified within the facility adjacent the proposed remediation works and will be clearly marked and protected with temporary fencing for the duration of the remedial works.

The Project Manager (Capcorp) has engaged an archaeologist to be available during the works if an assessment of an area affected by the remediation works is required.

2.4 Topography

The 'AD' is approximately 580m the Australian Height Datum (AHD) and is generally flat with a western slope towards the Royal Canberra Golf Course and appears to be located on top of what might be an old stormwater drain which is in line with a now redundant septic tank. The nearest surface water body is Warrina Inlet of Lake Burley Griffin which is approximately 600m northwest of the site.

2.5 Hydrology

Canberra has an average annual rainfall of 629mm with most of the rain falling between the months of March and May and September to November.

The dump site is unsealed and well vegetated and slopes to the west. Runoff from the sites is expected to be minimal except in very wet conditions when the soil becomes saturated. Drainage is expected to follow the old stormwater drain therefore contamination (if any) would be expected to follow the drain to the west toward Lake Burley Griffin.

2.6 Geology

Reference to the Bureau of Mineral Resources, Geology and Geophysics 1:100,000 scale Geological Series Sheet '*Canberra*' (Sheet 8727, 1992) indicates that the site is underlain by the Yarralumla Formation. The formation is described as a calcareous and tuffaceous mudstone and siltstone, with minor limestone, calc-silicate hornfels and quartz sandstone which is a suite of sedimentary deposits Silurian in age (425 m.y.).

As discussed further in **Section 3**, an environmental audit was undertaken in 2006 and a number of boreholes were located along the east side of the dump. Further, during the initial phase of the dump remediation in 2007, a number of test pits were dug in the dump itself. Based on the bore hole data and test pit data, the fill soil was

found to be approximately 2.5 m – 3 m deep overlying brown clays and yellow siltstone.

Based on this investigation the natural soils may be described generally as either a sandy clay, orange to red, exhibiting medium plasticity with minor medium grained gravels or a yellow weathered granite.

2.7 Hydrogeology

Reference to the Bureau of Mineral Resources, Geology and Geophysics (1984) 1:100,000 scale map '*Hydrogeology of the Australian Capital Territory and Environs*' indicates that the groundwater is anticipated to be hosted in a fractured rock aquifer. High yielding zones would be associated with upper and lower portions of the individual ash-flow tuffs and interbedded sediments.

The groundwater yield beneath the site is estimated to be between 0.5 litres per second (L/sec) and 1.0 L/sec, while the concentration of total dissolved solids (TDS) is estimated to be less than 500 milligrams per litre (mg/L).

Groundwater was not encountered in any of the boreholes or test pits from previous assessments. However, as the area of concern may have landfill characteristics, there is the potential for a perched aquifer to be present within or at the base of the fill material which may be contaminated. Therefore, this feature has been included in the Conceptual Site Model (CSM) to ensure this feature is considered during the proposed remedial works (Refer **Figure 5** and **Figure 5A**).

During this investigation water was encountered in two (2) of the 25 test pits, TP8 and TP10. Based on the observed sudden inflow of water into the test pit, particularly TP10 at 4.6 mbgl, and as the site had received a recent significant rainfall (53.6 mm between 1 and 7 December 2014 with 29.6 mm falling on 7 December 2014 was recorded at the Tuggeranong weather station by the Bureau of Meteorology), the water is thought to be seepage water/perched water lens and not the regional water table.

2.8 Surrounding Land Uses

The land uses surrounding the site are summarised in **Table B** below.

Table B: Summary of Surrounding Land Uses.

Direction from Site	Site Use	Description of Site Use
North	Residential	Lane Poole Place This area is Zoned 'RZ1 – Suburban
East	Brickworks infrastructure and Thor's Hammer recycled wood centre.	This area is the Canberra Brickworks site and is zoned as Rural RZ1: SUBURBAN; CZ6: LEISURE AND ACCOMMODATION.
South	Restricted Open Space, Public Space	This land is undeveloped and is currently zoned accordingly:

Direction from Site	Site Use	Description of Site Use
	and Designated Land	Directly south of the site: Block 7 Section 102 - CZ6: LEISURE AND ACCOMMODATION; PRZ2: RESTRICTED ACCESS RECREATION ZONE Block 1 Section 127 - PRZ2: RESTRICTED ACCESS RECREATION ZONE; DES: DESIGNATED
West	Two (2) blocks defined as Open Public Space are located directly adjacent the site and the Royal Canberra Golf Course (Block 2 Section 119)	This land is undeveloped and is currently zoned accordingly: Block 20 Section 102 – CZ6: LEISURE AND ACCOMMODATION Block 1 Section 127 - PRZ2: RESTRICTED ACCESS RECREATION ZONE; DES: DESIGNATED

2.9 Proposed Redevelopment

Robson understands that the aim at this stage in the planning process is to remediate the 'AD' which would include the reinstatement of the area to permit high density residential land use as defined by the ASC NEPM (2013) as Health Investigation Level HIL'B' – '*Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats'.*

3 PREVIOUS ENVIRONMENTAL REPORTS

The previous environmental site assessments (ESA's) undertaken of the Canberra Brickworks site (Block 1 Section 102) include studies from 2001 to present. However, the previous environmental site assessments (ESA's) and reports are not specific to the 'AD'. All reports have been included as aspects of the studies have addressed the 'AD'. These reports include:

- Connell and Wagner 2001 - *Appendix F-Brickworks Contamination Report*;
- Robson Laboratories Pty Ltd (October 2006) '*Environmental Investigation – Audit Report Yarralumla Brickworks Block 1 Section 102 Yarralumla Canberra Central ACT.* (Robson reference 3144_ CL_EI Final_20061018);
- Robson Laboratories Pty Ltd (2007) *'Remediation Action Plan - Asbestos Dump Yarralumla Brickworks Block 1 Section 102 Yarralumla Canberra Central ACT'.* (Robson reference 3144_ CL_RAP_20070612);
- Robson Environmental Pty Ltd *(2014) 'Remediation Action Plan, Stage 1 and 2 (Includes Hazardous Materials) Draft Canberra Brickworks Remediation Project Downer Block 1 Section 102, Yarralumla Canberra Central ACT'.* (Robson reference 9623_EAR_Draft RAP_Ver 3_20140407).

3.1 Summary of Previous Assessment Reports

A summary of each of these reports is presented below.

3.1.1 Connell Wagner – Brickworks Contamination Report (2001)

The study was a preliminary (Phase 1) assessment of potential site contamination and was part of a Development Control Plan (DCP) commissioned by the ACT Government. The assessment was based on interviews with persons who worked on the brickworks and a desktop study which undertook the review of available historic information.

The study identified a number of locations on the site which could be sources of on-site contamination but did not identify any potential off-site contamination sources.

The potential on-site sources of contamination identified are listed below and those located in the vicinity of the 'AD' are shown on **Figure 6**:

- Coal and Oil Storage Bunkers (NE5);
- Forklift Shed (A6);
- Model Railway Workshops (M1-M3);
- Septic Tank (ST);
- Blacksmiths Shop (M1-M3);
- Explosive Storage Area (ES);
- General fill on the site; and
- The Asbestos Dump ('AD').

Of the potential on-site sources listed above other than the 'AD', only the septic tank is located within the known boundary of the 'AD'.

The report also makes comment on the likely presence of above ground hazardous material in buildings and that the site (Brickworks) has been filled in places with materials that have been sourced from the site.

The report concludes that it is probably suitable for its intended site use (a commercial and recreational facility) provided the potential sources of contamination are investigated in accordance with Environment ACT requirements.

3.1.2 Robson Report (October 2006) – Environmental Investigation

In 2006 Robson was engaged by ACT Property Group to undertake an Environmental Investigation (Audit) of the Brickworks site. The scope of the investigation was to characterise where possible, the on-site contamination sources (the AECs) that had been identified in the Contamination Report (Desk-Top Study) undertaken by Connell-Wagner in 2001 which included the 'AD'. As this SAQP is specific to the 'AD,' only the results related to the 'AD' are briefly discussed below.

The sample locations relevant to the 'AD' are presented in **Figure 6**.

Due to access difficulties only the eastern boundary of the 'AD' was investigated. Two (2) bore holes (BH4 and BH5 (BH5A)) were drilled to auger refusal 3.2 m and 4.7 m respectively and two (2) soils samples were taken from each and analysed for a selection of the following contaminants: TPH, PAH, OCP, PCB, Eight (8) Heavy Metals As, Cd, Cr, Cu, Hg, Pb, Ni and Zn and Asbestos. Contaminants of concern were not identified above the assessment criteria (Residential 'HIL A' Land Use) in these locations.

3.1.3 Robson Report (June 2007) – Remediation Action Plan

Based on the recommendations made in the Robson (2006) Environmental Investigation (Audit), a RAP was prepared for the removal of the asbestos waste from the 'AD' and subsequent validation of the site for Sensitive Land Use ('HIL A'). The scope of the RAP included the removal of the vegetation cover, the removal of accessible surface asbestos sheet materials, separation and stockpiling of all recyclable material, the removal and stockpiling of all other waste materials for waste classification purposes, validation of the resultant excavation for Sensitive Land Use and site reinstatement.

The RAP was only partly implemented as the project was stopped by the ACT Planning and Land Association (ACTPLA) due to the requirement for Development Approval (DA) to be in place when removing significant quantities of soil. The work allowed for an improved assessment of the extent of the dump and limited soil sampling from test pits and a stockpile. The results of the remedial works have not been presented in a report format. However, from records held by Robson, the observations and a brief discussion of the analytical results are presented below.

<u>Field Observations</u>

Following the removal of the vegetation which was primarily blackberry vines from the southeast corner of the 'AD', corrugated asbestos sheeting was visible and accessible. Manual removal of the sheeting was undertaken and approximately 50 tonnes of sheeting was removed from the site before the project was discontinued due to DA requirements and budgetary constraints. Apart from the asbestos, a septic tank and fill (general builders waste including brick, concrete, metal (car bodies),

tyres and wood), evidence of other contaminants of concern (staining, olfactory indicators) were not observed.

After the vegetation had been removed, six (6) samples were taken from across the mounded dump surface and the locations included four (4) test pits, one (1) stockpile and one (1) sample from within the creek line adjacent the septic tank. In summary six (6) soil samples were taken from six (6) locations from varying depths ranging from the 0.0m to 3m across the accessible part of the 'AD'. The field work was undertaken on the 18 June 2007. The waste materials observed in the fill at these sample locations included: brick, concrete, ash, plastic and asbestos as sheet fragments and millboard insulation.

The soil samples were analysed for the following contaminants of potential concern (COPC): TPH, PAH, Heavy Metals (As, Cd, Cr, Cu, Hg, Pb, Ni & Zn), OCP, PCBs and Asbestos.

Analytical Results

Asbestos fibres were identified in the soil in four (4) of the six (6) soil samples and a low concentration of Total Petroleum Hydrocarbons (TPH) (110mg/kg TPH - C_{29}-C_{36}) was identified in the soil sample taken from one location (Test Pit 1). Apart from the asbestos all other contaminants of concern were below the assessment criteria (Residential 'HILA' Land Use).

3.1.3 Robson Report (April 2014) – Remediation Action Plan

A revised RAP was prepared for the 'AD' with the objective to remediate the site to permit mixed commercial and residential land use ('HIL B'). The RAP comprises of two (2) stages:

- Stage 1 includes the removal of the vegetation, the removal of accessible asbestos sheet materials and the implementation of an Environmental Site Assessment (ESA) to better characterise and delineate the waste;
- Based on the information derived from the ESA, Stage 2 of the RAP will be to incorporate the results of Stage 1 and amend the RAP accordingly such that remediation can be achieved in the most effective way possible.

3.1.4 Summary of Known Soil Contamination

Based on field observations and limited analytical data, the soils associated with the dump are impacted with asbestos sheet fragments and fibre bundles.

Other industrial COPCs have not been detected in the limited analytical data that is available. Despite this, future soil assessments and site validation assessments should include the other common industrial contaminants of concern namely TRH, BTEX, PAH, Phenols, OCP, PCB and eight (8) metals, unless it can be demonstrated these contaminants are not of concern.

In addition to these COPCs, the other potential contaminant sources that may comprise of additional COPCs identified by Connell Wagner (2001) include an explosive store and a septic system (present in the 'AD'). Further, as the site has been used as a dump it is possible that municipal waste may be present in the waste stream and therefore methane gas may also need to be considered as a COPC.

Based on information provided in the Connell Wagner (2001) report the Brickworks ceased operation in 1976 and aerial photographs indicate that the 'AD' is present on site from 1980. Further, the report states the Explosive Store was only used in the early life of the Brickworks pre-1920. Also the report makes no mention of municipal waste being brought onto the site.

Based on this information and on the more recent site investigations undertaken by Robson (2006 and 2007) that did not identify such sources either visually or by soil analysis, Robson considers the likelihood of contaminants related to explosives and municipal waste to be present in the dump to be unlikely.

A septic system is known to be present within the 'AD'. Based on the Connell Wagner (2001) report the septic system was in use in 2001 but Robson understands it is not currently in use and has not been in use for some years. Therefore, the likelihood of significant volumes of sewage is considered to be unlikely. Therefore this source is not expected to be a significant health or environmental risk.

However, during the course of the ESA, if field investigations reveal evidence to suggest such sources, the Contaminants of Potential Concern (COPC) should be adjusted to accommodate these finds. These include the following:

- Explosive Screen (includes nitro-glycerine);
- Pathogens: E coli, Faecal Coliforms and Total Coliforms; and
- Methane Gas.

At the time of septic tank removal and site validation it may be prudent to target the septic tank and the area for pathogens.

4 DATA QUALITY OBJECTIVES

The DQOs is a seven (7) step process used to aid the planning of environmental investigations by providing a structured methodology for assessing the most appropriate environmental data collection processes, including the identification of sample locations, number of samples required, sampling methods and defining an acceptable assessment criteria.

The DQO process has been used to aid the development of the RAP and the SAQP for this Stage 1 ESA and were prepared in general accordance with Appendix C of the Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil – Part 1: Non-Volatile and Semi-Volatile Compounds*' and the USEPA (2000) '*Data Quality Objectives Process for Hazardous Waste Site Investigation*' (EPA QA/G-4HW).

The DQOs developed for this project are presented in the SAQP as referenced below and have been included in **Appendix A.**

Robson Environmental Pty Ltd 16 September 2014 *–'Sample Analysis Quality Plan Stage 1 Environmental Site Assessment of the Remediation Action Plan – Canberra Brickworks Remediation Project Block 1 Section 102 Canberra Central ACT (Document Reference* 9623_EAR_SAQP_20140916.docx*)'.*

Elements of the DQOs are referred to as necessary in the following sections of this Stage 1 ESA.

5 ASSESSMENT CRITERIA

Investigation and screening level criteria as defined in the ASC NEPM (2013) are the concentrations of contaminants above which further assessment and /or appropriate remediation may be required.

Robson understands that the site is to be redeveloped for mixed-use high density residential and commercial land use. The assessment criteria applicable to this exposure scenario and sourced from the ASC NEPM (2013) are the Health-based Investigation Level (HIL) 'B'- *'Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high-rise buildings and flats'*.

The ASC NEPM 2013 also provides health screening levels (HSLs) for petroleum hydrocarbon compounds. It is considered that the dominant exposure pathway to petroleum hydrocarbon compounds would likely be via vapour inhalation, and therefore criteria sourced from Table 1A (3) have been adopted for the purpose of screening during this assessment.

In addition to the above, the ASC NEPM 2013 also provides ecological investigation levels (EILs) for common contaminants (including arsenic, copper, chromium (III), DDT, naphthalene, nickel, lead and zinc), and ecological screening levels (ESLs) for petroleum hydrocarbons (including benzene, toluene, ethylbenzene and xylene (BTEX), benzo(a)pyrene (B(a)P), and total recoverable hydrocarbon (TRH) fractions. The EILs and ESL should generally be applied to soil that will remain on the site and within the top two (2) metres (m) of the finished surface / ground level for generic land use. This generally corresponds to the root zone and habitation zone of many plant species.

For the purposes of this ESA it may not be necessary to assess the results against the EILs and ESLs as the material if assessed as unsuitable for site use which is expected, will either be assessed as suitable for BRU in a commercial/industrial setting or it will be disposed directly to land fill. However, the criteria have been included as possible assessment criteria in the event they are applicable.

EIL Ambient Background Concentrations (ABCs)

The Environmental Investigation Levels ambient background concentrations (ABCs) for copper, chromium (III), nickel, lead and zinc were determined in the following manner.

In the first instance the EIL land use setting for the site is considered to be 'urban residential and public open space' therefore the protection level for this land use setting is 80%.

It is assumed that the ecosystem is adapted to the ABC for the locality and it adding the contaminants over and above the background concentration which has an adverse affect on the environment.

For this assessment samples were to be taken in natural soils in the dump, to the east and west (down gradient) of the dump (refer **Figure 4**). Robson considers these locations to be representative with regard to the ABCs for arsenic, copper, chromium (III), DDT, naphthalene, nickel, lead and zinc.

The derived ABCs for copper, nickel chromium and zinc are presented in **Table 5** at the rear of this report and were used to derive the EILs for these metals specific for the site using the ASC NEPM Toolbox '*Ecological Investigation Levels – Interactive (Excel) Calculation Spreadsheet*' (ASC NEPM 2013) which are also presented in **Table 5.**

HSLs, ESLs and TRH Management Limits

Based on previous investigations as presented in **Section 3** the soil sampled from the bore holes east of the dump and from the test pits within the dump were silty clay. However, this investigation considers the dominant soil type to be a sandy clay. For the purpose of establishing the assessment criteria for HSL, ESL and TRH Management Limits the soils will be considered to be a clay.

To assess the suitability of the soil in the vicinity of the dump, the HSL criteria for clay has been applied while the suitability of the soil with regards to ecological considerations has been assessed against the ESL criteria for fine soil texture. For the purpose of this assessment, the depth applied to establish the HSL criteria was 0 m to < 1 m which is considered appropriate as there is a high likelihood that soil will occur within this depth range.

Following the assessment of TRH (fractions F1 – F4) impacts with consideration given to the ESL and HSLs, the TRH Management Limits may also need to be considered and these shall be sourced (when required) from Table 1(B)7 *'Management Limits for TRH Fractions F1 – F4) in Soil'* of the ASC NEPM (2013). As the proposed land use includes a residential component, the residential, parkland and open space category with a 'fine' soil texture has been used to determine the TRH Management Limits criteria.

A summary of the adopted HILs and HSLs for the 'AD' assessment are presented below in **Table C**, and the adopted EILs and ESLs are summarised in the following **Table D** overleaf.

Table C: Soil Assessment Criteria (HILs and HSLs)

Contaminant	HIL B [1] (mg/kg)	HSL B[2](Clay) (mg/kg)
ACM	0.04 % w/w	NE
Fibrous Asbestos (FA)	0.001 % w/w	NE
Asbestos Fines (AF)	0.001 % w/w	NE
Benzene	NE	0.7
Ethylbenzene	NE	NL
Toluene	NE	480
Xylene (m & p)	NE	NE
Xylene (o)	NE	NE
Xylene Total	NE	110
F1 (TPH C_6 – C_{10} minus BTEX)	NE	50
F2 (TPH greater than (>) C_{10} - C_{16} minus naphthalene)	NE	280
Carcinogenic PAHs (as B(a)P TEQ)	4	NE
Napthalene	NE	5
PAHs (Sum of total)	400	NE
Phenol	45,000	NE
DDT+DDE+DDD	600	NE
Aldrin and dieldrin	10	NE
Chlordane	90	NE
Endosulfan	400	NE
Endrin	20	NE
HCB	15	NE
Heptachlor	10	NE
Methoxychlor	500	NE
Mirex	20	NE
Toxaphene	30	NE
PCBs (Sum of total)	1	NE
Arsenic (total)	500	NE
Cadmium	150	NE
Chromium (VI)	500	NE
Copper	30,000	NE
Lead	1,200	NE
Mercury (inorganic)	120	NE
Nickel	1200	NE
Zinc	60,000	NE

Notes:

1. ASC NEPM (2013) – Table 1A(1) '*Health investigation levels for soil contaminants*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HIL B Exposure Setting: *'Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high-rise buildings and flats'*.

2. ASC NEPM (2013) – Table 1A (3) '*Soil HSLs for vapour intrusion*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HSL A & HSL B Exposure Setting: Low to high density residential. Adopted value is for a clay soil at a depth of 0 m to < 1 m.
NE = Not established, mg/kg = milligrams per kilogram, TEQ = toxicity equivalent quotient, PAH = Polycyclic Aromatic Hydrocarbons

Table D: Soil Assessment Criteria (EILs and ESLs)

Contaminant	EIL[1] (mg/kg)	ESL[2] (Fine) (mg/kg)
Benzene	NE	65
Ethylbenzene	NE	125
Toluene	NE	105
Xylene (m & p)	NE	NE
Xylene (o)	NE	NE
Xylene Total	NE	45
F1 (TPH C_6 – C_{10} minus BTEX)	NE	180 (800[4])
F2 (TPH greater than (>) C_{10} - C_{16})	NE	120 (1,000[4])
F3 (TPH > C_{16} - C_{34})	NE	1,300 (3,500[4])
F4 (TPH > C_{34} - C_{40})	NE	5,600 (10,000[4])
Carcinogenic PAHs (as B(a)P)	NE	0.7
Napthalene	170	NE
PAHs (Sum of total)	NE	NE
Phenol	NE	NE
DDT	180	NE
Aldrin and dieldrin	NE	NE
Chlordane	NE	NE
Endosulfan	NE	NE
Endrin	NE	NE
HCB	NE	NE
Heptachlor	NE	NE
Methoxychlor	NE	NE
Mirex	NE	NE
Toxaphene	NE	NE
PCBs (Sum of total)	NE	NE
Arsenic (total)	104	NE
Cadmium	NE	NE
Chromium (III)	**630**	NE
Copper	**86**	NE
Lead	1,131	NE
Mercury (inorganic)	NE	NE
Nickel	**169**	NE
Zinc	**451**	NE

Notes:

1. ASC NEPM (2013) – Table 1B (5) '*Generic EILs for aged As, Pb, fresh DDT and fresh naphthalene in soil irrespective of their physicochemical properties*'.
2. ASC NEPM (2013) – Table 1B(6) *'ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)Pyrene in soil'* of Schedule B1 *'Guideline on Investigation Levels for Soil and Groundwater'*, ESL setting urban residential and public open space.
3. ASC NEPM (2013) – ASC NEPM Toolbox, '*Ecological Investigation Levels – Interactive (Excel) Calculation Spreadsheet*'. Assuming the heavy metals are aged, that is, greater than two (2) years old. Soil physiochemical properties required to calculate EILs for Cu, Ni, CrIII and Zn were determined in the field through the analysis of a representative number of soil samples. Numbers in **Bold** are the site specific EILs for Cu, Ni, CrIII and Zn derived using the

field data entered into the ASC NEPM Toolbox (refer **Table 5** at the rear of this report for the site specific criteria calculations).

4. ASC NEPM (2013) Table 1B(7) *'Management Limits for TPH fractions F1-F4 in soils';* Soil texture 'fine', residential, parkland and open public space exposure setting.

NE: Not established, mg/kg = milligrams per kilogram.

The standard laboratory analysis for chromium provides a total concentration (that is, the result is unspeciated for chromium (III) and chromium (VI)). As the HIL 'B' assessment criteria for chromium (VI) is 500 mg/kg, it was considered that should the measured concentration of total chromium exceed this, then the sample would be re-analysed and speciated to measure the chromium (VI) concentration.

Statistical Evaluation

Statistical evaluation of soil analytical results may be necessary in the event of exceedences of the adopted assessment criteria. Statistical analysis should adhere to the following criteria:

- No single analytical result is to be greater than 250 % of the site criterion;
- The arithmetic mean of sample analytical results must be below the site criterion;
- The standard deviation must be less than 50 % of the site criterion.

It must also be emphasised that in the NSW EPA (1995) '*Sampling Design Guidelines*' that a site or sampling area cannot be considered to be uncontaminated or successfully remediated if the 95 % Upper Confidence Limit (UCL) of the arithmetic average concentration exceeds the assessment criterion. The 95 % UCL will therefore be considered as a primary tool to establish the efficacy of future remedial works.

Evaluation of Soil Assessment Criteria

SGS Services Pty Ltd (SGS) is the proposed primary laboratory, while Envirolab Pty Ltd (Envirolab) is the proposed secondary laboratory. Both laboratories are NATA endorsed for the proposed analytical suite.

The limits of laboratory reporting (LOR) for the analytical methods used by the primary laboratory were compared with the proposed assessment criteria. This was to ensure that the assessment criteria values exceeded the laboratory LOR. The results of the comparison are presented overleaf in **Tables E and F.**

Table E. Comparison of the Laboratory LOR with the Proposed Soil Assessment Criteria (HILs and HSLs)

Contaminant	HIL B [1] (mg/kg)	HSL B[2](Clay) (mg/kg)	Laboratory LOR (mg/kg)
Asbestos			
ACM	0.04 % w/w	NE	**0.1 g/kg (0.01 % w/w)**
Fibrous Asbestos (FA)	0.001 % w/w	NE	**0.1 g/kg (0.01 % w/w)**
Asbestos Fines (AF)	0.001 % w/w	NE	**0.1 g/kg (0.01 % w/w)**
Hydrocarbons			
Benzene	NE	0.7	0.1
Ethylbenzene	NE	NL	0.1
Toluene	NE	480	0.1
Xylene (m & p)	NE	NE	0.2
Xylene (o)	NE	NE	0.1
Xylene Total	NE	110	0.3
F1 (TPH C_6 – C_{10} minus BTEX)	NE	50	25
F2 (TPH greater than (>) C_{10} - C_{16} minus naphthalene)	NE	280	25
Polycyclic Aromatic Hydrocarbons (PAHs)			
Carcinogenic PAHs (as B(a)P TEQ)	4	NE	0.2
Napthalene	NE	5	0.1
PAHs (Sum of total)	400	NE	0.8
Phenol	45,000	NE	0.5
Organochlorine Pesticides			
DDT+DDE+DDD	600	NE	0.3 (combined)
Aldrin and dieldrin	10	NE	0.3 (combined)
Chlordane	90	NE	0.1
Endosulfan	400	NE	0.1
Endrin	20	NE	0.1
HCB	15	NE	0.1
Heptachlor	10	NE	0.1
Methoxychlor	500	NE	0.1
Mirex	20	NE	0.1
Toxaphene	30	NE	NA
PCBs (Sum of total)	1	NE	1
Metals			
Arsenic (total)	500	NE	3
Cadmium	150	NE	0.3
Chromium (VI)	500	NE	0.3
Copper	30,000	NE	0.5
Lead	1,200	NE	1
Mercury (inorganic)	120	NE	0.01
Nickel	1200	NE	0.5
Zinc	60,000	NE	0.5

Notes:

Bold: LOR is greater than the assessment criteria.

Table F. Comparison of the Laboratory LOR with the Proposed Soil Assessment Criteria (EILs and ESLs)

Contaminant	EIL[1] (mg/kg)	ESL[2] (Fine) (mg/kg)	Laboratory LOR (mg/kg)
Hydrocarbons			
Benzene	NE	65	0.1
Ethylbenzene	NE	125	0.1
Toluene	NE	105	0.1
Xylene (m & p)	NE	NE	0.2
Xylene (o)	NE	NE	0.1
Xylene Total	NE	45	0.3
F1 (TPH C_6 – C_{10} minus BTEX)	NE	180	25
F2 (TPH greater than (>) C_{10} - C_{16})	NE	120	25
F3 (TPH > C_{16} - C_{34})	NE	1300	90
F4 (TPH > C_{34} - C_{40})	NE	5600	120
Polycyclic Aromatic Hydrocarbons (PAHs)			
Carcinogenic PAHs (as B(a)P)	NE	0.7	0.2
Napthalene	170	NE	0.1
PAHs (Sum of total)	NE	NE	0.8
Phenol	NE	NE	0.5
Organochlorine Pesticides			
DDT +DDE+DDD	180	NE	0.3 (combined)
Aldrin and dieldrin	NE	NE	0.3 (combined)
Chlordane	NE	NE	0.1
Endosulfan	NE	NE	0.1
Endrin	NE	NE	0.1
HCB	NE	NE	0.1
Heptachlor	NE	NE	0.1
Methoxychlor	NE	NE	0.1
Mirex	NE	NE	0.1
Toxaphene	NE	NE	NA
PCBs (Sum of total)	NE	NE	1
Metals			
Arsenic (total)	104	NE	3
Cadmium	NE	NE	0.3
Chromium (III)	**630**	NE	0.3
Copper	**86**	NE	0.5
Lead	1,131	NE	1
Mercury (inorganic)	NE	NE	0.01
Nickel	**169**	NE	0.5
Zinc	**451**	NE	0.5

Notes:
Bold: LOR is greater than the assessment criteria.
1.ASC NEPM (2013) – ASC NEPM Toolbox, '*Ecological Investigation Levels – Interactive (Excel) Calculation Spreadsheet*'. Assuming the heavy metals are aged, that is, greater than two (2) years old. Soil physiochemical properties required to calculate EILs for Cu, Ni, CrIII and Zn were determined in the field through the analysis of a representative number of soil samples. Numbers in **Bold** are the site specific EILs for Cu, Ni, CrIII and Zn derived using the field data entered into the ASC NEPM Toolbox (refer **Table 5** at the rear of this report for the site specific criteria calculations).

With regards to the asbestos criteria and laboratory LORs, it is noted from the Australian Standard AS4964-2004 '*Method for the Qualitative Identification of Asbestos in Bulk Samples*', which is a NATA accredited method for qualitative identification of asbestos in bulk samples, that the limit of reporting (LOR) of asbestos by the laboratory is 0.1 g/kg, which is equivalent to 0.01 % weight per weight (% w/w). That is, the assessment criteria for FA and AF are therefore below the laboratory LOR. Other analytical methods for the detection of asbestos which can achieve the required FA and AF criteria are not NATA accredited methods but should be considered appropriate if required.

In the interim it is noted that the laboratories used do report in their comments section of the analytical report whether asbestos was detected but at concentrations below the LOR. If such a comment is made a precautionary approach will be adopted and the sample will be considered to exceed the assessment criteria. On the other hand, if the result is reported as being below the LOR and no additional comment is provided then the sample result will be considered to be below the assessment criteria.

Based on the review, the laboratory LOR for each analyte is considered suitable for the purpose of this ESA.

5.5.2 Classification of Soil for Off-Site Beneficial Re-Use

To permit flexibility with regard to the assessment of data collected during the ESA it may be possible to consider Beneficial Re-Use (BRU) of soil on a commercial/industrial site based on the results of the assessment.

Material assessed as unsuitable for on-site use may be suitable for BRU on other properties within the ACT (most likely day cover at the West Belconnen Resource Management Centre (WBRMC) or commercial / industrial properties).

The criteria considered to be applicable for the assessment of the material for BRU on commercial / industrial properties are the NEPM HIL 'D' which includes premises such as shops and offices as well as factories and industrial sites. HSL 'D' and ESL 'Fine' would be applied to assess hydrocarbon impacts when required. The proposed soil criteria for assessment for off-site BRU are summarised below in **Tables G and H**.

Table G: Proposed Assessment Criteria for Off-Site Beneficial Re-Use (HIL and HSL)

Contaminant	HIL D [1] (mg/kg)	HSL D[2](Clay) (mg/kg)	WA Guideline[2] (% w/w)
ACM	NE	NE	0.05
Fibrous Asbestos (FA)	NE	NE	0.001
Asbestos Fines (AF)	NE	NE	0.001
Benzene	NE	4	NA
Ethylbenzene	NE	NE	NA
Toluene	NE	NE	NA
Xylene (m & p)	NE	NE	NA

Contaminant	HIL D [1] (mg/kg)	HSL D[2](Clay) (mg/kg)	WA Guideline[2] (% w/w)
Xylene (o)	NE	NE	NA
Xylene Total	NE	NL	NA
F1 (TPH C_6 – C_{10} minus BTEX)	NE	310	NA
F2 (TPH greater than (>) C_{10} - C_{16} minus naphthalene)	NE	NE	NA
Carcinogenic PAHs (as B(a)P TEQ)	40	NE	NA
Napthalene	NE	NL	NA
PAHs (Sum of total)	4,000	NE	NA
Phenol	24,0000	NE	NA
DDT+DDE+DDD	3,600	NE	NA
Aldrin and dieldrin	45	NE	NA
Chlordane	530	NE	NA
Endosulfan	2,000	NE	NA
Endrin	100	NE	NA
HCB	80	NE	NA
Heptachlor	50	NE	NA
Methoxychlor	2,500	NE	NA
Mirex	100	NE	NA
Toxaphene	150	NE	NA
PCBs (Sum of total)	7	NE	NA
Arsenic (total)	3,000	NE	NA
Cadmium	900	NE	NA
Chromium (VI)	3600	NE	NA
Copper	240,000	NE	NA
Lead	1,500	NE	NA
Mercury (inorganic)	730	NE	NA
Nickel	6,000	NE	NA
Zinc	400,000	NE	NA

Notes:

1. NEPM (1999, amended 2013) – Table 1A(1) '*Health investigation levels for soil contaminants*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HIL D commercial/industrial such as shops, offices, factories and industrial sites
2. NEPM (1999, amended 2013) – Table 1A(3) '*Soil HSLs for vapour intrusion*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HSL D Exposure Setting: Commercial and Industrial. Adopted value is for a clay soil at a depth of 0 m to < 1 m.

NE = Not established; NA = Not Applicable; mg/kg = milligrams per kilogram; TEQ = toxicity equivalent quotient;
PAH = Polycyclic Aromatic Hydrocarbons

Table H: Proposed Assessment Criteria for Off-Site Beneficial Re-Use (EIL and ESL)

Contaminant	EIL[1] (mg/kg)	ESL[2] (Fine) (mg/kg)
Benzene	NE	95
Ethylbenzene	NE	185
Toluene	NE	135
Xylene (m & p)	NE	NE
Xylene (o)	NE	NE
Xylene Total	NE	95
F1 (TPH C_6 – C_{10} minus BTEX)	NE	215
F2 (TPH greater than (>) C_{10} - C_{16})	NE	170
F3 (TPH > C_{16} - C_{34})	NE	2500
F4 (TPH > C_{34} - C_{40})	NE	6600
Carcinogenic PAHs (as B(a)P)	NE	1.4
Napthalene	370	NE
PAHs (Sum of total)	NE	NE
Phenol	NE	NE
DDT	640	NE
Aldrin and dieldrin	NE	NE
Chlordane	NE	NE
Endosulfan	NE	NE
Endrin	NE	NE
HCB	NE	NE
Heptachlor	NE	NE
Methoxychlor	NE	NE
Mirex	NE	NE
Toxaphene	NE	NE
PCBs (Sum of total)	NE	NE
Arsenic (total)	160	NE
Cadmium	NE	NE
Chromium (III)	190 – 400 (TBD)	NE
Copper	60 – 800 (TBD)	NE
Lead	1800	NE
Mercury (inorganic)	NE	NE
Nickel	30 – 560 (TBD)	NE
Zinc	70 – 1300 (TBD)	NE

Notes:

1. NEPM (1999, amended 2013) – Table 1B (5) '*Generic EILs for aged As, Pb, fresh DDT and fresh naphthalene in soil irrespective of their physicochemical properties*'.
2. NEPM (1999, amended 2013) – Table 1B (6) *'ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)Pyrene in soil'* of Schedule B1 *'Guideline on Investigation Levels for Soil and Groundwater'*, ESL setting commercial and industrial.
3. NEPM (1999, amended 2013) – ASC NEPM Toolbox, '*Ecological Investigation Levels – Interactive (Excel) Calculation Spreadsheet*'. Assuming the heavy metals are aged, that is, greater than two (2) years old. Soil physiochemical properties required to calculate EILs for CrIII, Cu, Ni, and Zn (refer TBD below).

NE: Not established.
mg/kg = milligrams per kilogram.
NL: Non-limiting.
TBD: To be determined and will depend on the destination of the site. **Note:** These concentration

ranges are Added Contaminant Limits (ACLs) and the Ambient Background Concentrations (ABCs) when determined must be added to determine the EIL.

5.1 Classification of Waste Soil for Off-Site Disposal

To permit flexibility with regard to the assessment of data collected during the ESA it may be possible to consider Waste Classification from this in-situ assessment and is therefore discussed in this section.

Soil material that is considered to be unsuitable for off-site BRU at a commercial and industrial site would be disposed at a licensed waste facility in the ACT in accordance with the criteria presented in Environment ACT (2000) '*ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Waste*', a summary of which is provided below in **Table I**. It is also noted that soil potentially impacted with asbestos is to be classified as an '*asbestos contaminated waste*' and would therefore require removal in accordance with ACT EPA Contaminated Sites Information Sheet No. 5 (2011) '*Requirements for the Transport and Disposal of Asbestos Contaminated Wastes*'.

Table I: Soil Waste Assessment Criteria

Contaminant	Waste Classification (Environment ACT Table A3)[1] (mg/kg)		
	Inert	Solid	Industrial
Hydrocarbons (BTEX and TPH)			
Benzene	1	10	40
Ethylbenzene	60	600	2400
Toluene	28	288	1152
Xylene (m & p)	NE	NE	NE
Xylene (o)	NE	NE	NE
Xylene Total	100	1000	4000
TPH ($C_6 - C_{10}$)	650	650	2600
TPH ($C_{10} - C_{40}$)	5000	10000	40000
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	NE	NE	NE
Carcinogenic PAHs (as B(a)P TEQ)	0.08	0.8	3.2
PAHs (Sum of total)	200	200	800
Total Phenolics			
Phenol (non-halogenated)	28	288	1152
Organochlorine Pesticides			
DDT	NE	NE	NE
Aldrin and dieldrin	NE	NE	NE
Chlordane	NE	NE	NE
Endosulfan	NE	NE	NE

Contaminant	Waste Classification (Environment ACT Table A3)[1] (mg/kg)		
	Inert	Solid	Industrial
Endrin	NE	NE	NE
HCB	NE	NE	NE
Heptachlor	NE	NE	NE
Methoxychlor	NE	NE	NE
Mirex	NE	NE	NE
Toxaphene	NE	NE	NE
Polychlorinated Biphenyls			
PCBs (Sum of total)	2	<50	<50
Metals			
Arsenic	10	100	400
Cadmium	2	20	80
Chromium (III)	NE	NE	NE
Chromium (VI)	10	100	400
Copper	NE	NE	NE
Lead	10	100	400
Mercury (inorganic)	0.4	4	16
Nickel	4	40	160
Zinc	NE	NE	NE

Notes to Table M:
NE: Not established
[1] CT: Contaminant Threshold values for waste classification without doing the leachate test.

With regards to the above, it is noted that if exceedences of the Solid Waste Classification criteria of Table A3 are recorded, then additional laboratory analysis to determine the leachability of samples (using the Toxicity Characteristic Leaching Procedure (TCLP) may be undertaken, with the results then being compared against criteria sourced from Table A4 of Environment ACT (2000) '*ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Waste*'.

5.2 Airborne Fibre Monitoring Criteria

The control level for airborne fibre concentrations recorded during air monitoring will be 0.01 fibres/mL, as required by National Occupational Health and Safety Commission (NOHSC): 2002 (2005) '*Safe Removal of Asbestos, 2nd Edition*'. It is further noted that 0.01 fibres/mL represents a concentration that is 1/10th of the WorkSafe Australia's recommended Exposure Standard for all forms of asbestos of 0.1 fibres/mL, as documented in the guideline NOHSC:1003 (1995, amended 2003) '*Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment*'.

6 QUALITY ASSURANCE AND QUALITY CONTROL PROGRAMME

QA/QC methods were undertaken in accordance with Australian Standard AS4482.1-2005 '*Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds'*.

6.1 Field QA/QC

Field QA/QC sampling protocols would include the collection of the following QA/QC samples during sampling:

- A duplicate sample (intra - lab), which is a sample collected at the same place and time as the primary sample and intended to represent the same entity as closely as possible. Duplicate samples were collected at a rate of one (1) duplicate collected for every ten (10) primary samples collected;
- A triplicate sample (inter-lab), which is a sample collected at the same place and time as the primary sample and sent to a second laboratory to assess the quality of the primary laboratories testing procedures. The sample is intended to represent the same entity as the routine sample as closely as possible. Triplicate samples were collected at a rate of one (1) sample per twenty (20) primary samples collected;
- Rinsate samples were collected to assess the effectiveness of the decontamination procedures used on re-usable equipment. These samples were collected by pouring laboratory supplied deionised water over a piece of decontaminated equipment and into sample jars and analysed. One (1) rinsate sample was collected per day of sampling;
- A trip spike is a sample with known quantities of the analytes of interest supplied by the laboratory in the same type of container that is required for the analytical test of a sample collected in the field. These samples were taken from the laboratory to the sampling site and returned to the laboratory unopened. The samples are a required quality control element for volatile sampling and analysis. The laboratory checked for degradation of analyte during collection/storage/handling of field samples;
- A trip blank is laboratory supplied clean sand in a sealed sample jar. The jar was placed with the field samples and transported with the field samples to the laboratory for testing for the volatile analytes of the contaminant suite. The purpose is to determine the potential for cross contamination during sampling and sample transport.

All samples were stored in an ice cooled sealed container with chain of custody documentation and transported to a NATA registered laboratory.

All reusable sampling equipment was decontaminated between each sampling event by washing in clean tap water then in a solution of laboratory-grade phosphate free detergent (Decon 90) followed by rinsing with tap water.

7 SAMPLING METHODOLOGIES

Methodologies employed for the collection of the soil samples are summarised below. The sampling was completed in accordance with the following standards and guidelines:

- Australian Standard AS 4482.1-2005 '*Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds*';
- ACT ESDD (2014) Contaminated Sites Information Sheet 4 '*Requirements for the Re-Use and Disposal of Contaminated Soil*';
- ACT ESDD (2014) Contaminated Sites Information Sheet No. 5 '*Requirements for the Transport and Disposal of Asbestos Contaminated Wastes*';
- ACT ESDD (2014) Contaminated Sites Information Sheet No. 6 '*Management of Small Scale, Low Risk Soil Asbestos Contamination*';
- Environment ACT (2000) '*Environmental Guidelines: Assessment & Classification of Liquid & Non-Liquid Wastes'*;
- ASC NEPM (2013);
- NSW EPA (1995) '*Sampling Design Guidelines*'; and
- WA DOH (2009) '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*' (WA Guidelines).

In addition to the above, the sample program was undertaken in general accordance with the Robson Standard Operating Procedure (SOP) titled '*Soil Sampling and Logging*' (Robson reference EAR-SOP003, 2012) and the SOP *'Soil Sampling for Asbestos' (Robson reference* EAR-SOP009 2012) (refer **Appendix H**).

Sample design was undertaken in accordance with the SAQP by Robson Environmental Pty Ltd (September 2014) '*Sample Analysis Quality Plan – Canberra Brickworks Remediation Project'* (Robson Reference: 9623_EAR_SAQP_20140916. docx) which had been reviewed and endorsed by the NSW EPA accredited contaminated land Auditor.

In accordance with Table A of NSW EPA (1995) '*Sampling Design Guidelines*' a minimum of approximately thirteen (13) systematic sample points would be required for a site covering the combined site area of 4,500 m^2 to identify a hotspot of around 23.1 m diameter with 95 % confidence. In this case 16 locations were selected within the boundary of the area of impact and an additional six (6) locations were selected down gradient within the drainage line and three (3) up gradient on the east side of the dump outside the vegetated area.

In addition, the test pits were connected with north-south trenches to determine whether there was a significant difference in fill between the test pits. Where significant changes were observed it was expected that additional samples would be taken (refer to **Figure 4**). The location of the trenches was designed to be representative with the aim of characterising the waste.

As asbestos is one (1) of the contaminants of concern the Western Australia Department of Health (2009) "*Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia*" (herein referred

to as WA Guidelines) which have been adopted by the ASC NEPM (2013) was also considered. The WA guideline recommends the sampling density to be double the sampling density of what is set out in the NSW EPA (1995) '*Sampling Design Guidelines*'. However, considering the fact that asbestos is known to be present in significant quantities and the objective of this assessment is to characterise and delineate the extent of the waste, the additional sample points were considered unlikely to add value to the assessment. Therefore, the sample design as described above is considered to be satisfactory.

7.1 Sampling Methods

Soil samples that were collected were screened in the field with a portable PID to assess the potential for ionisable volatile compounds in soil. The sensitivity of the PID is dependent on the organic compound and varies for different mixtures of hydrocarbons. The PID was calibrated daily prior to use with a standard reference gas of known concentration (Isobutylene 100 parts per million (ppm)) and fresh air. Calibration records for the PID are presented in **Appendix B**.

Each sample was collected with a clean disposable nitrile glove and was placed in laboratory prepared sample containers and labelled with unique sample identification. Collected samples were placed in an ice cooled esky immediately after collection and during transport to a NATA accredited laboratory. Chain of Custody (COC) documentation was completed at the time of sample collection and accompanied the samples to the laboratory.

Specific soil sampling methods are briefly described below.

7.1.1 Test Pits

The samples were taken from targeted soil horizons from within the test pit using an excavator. Approximately, 0.1 - 0.2 m is removed at that soil horizon and sub-sampled from the excavator bucket.

7.1.2 Asbestos Materials

Suspect asbestos containing materials were moistened with a fine water spray prior to being sampled with a clean disposable nitrile glove.

7.1.3 Asbestos in Soil

Soil samples collected for asbestos analysis were collected in general accordance with the method outlined in the WA Guideline as described below;

A 10 litre (L) sample were collected and sieved through a 7 mm sieve. Identified ACM was collected and weighed, and the asbestos concentration in soil at each location was then calculated using the formula:

$$\% \text{ Soil Asbestos} = \frac{\% \text{ Asbestos Content x ACM (kg)}}{\text{Soil Volume (L) x Soil Density (kg/L)}}$$

To assess for Asbestos Fines (AF) at each sample location one (1) wetted 500 mL volume sample was also be collected. These samples were dispatched to a NATA accredited laboratory for analysis for asbestos in accordance with procedures outlined in Section 4.1.8 of the WA Guideline;

On a number of occasions the soil was not be suitable for sieving and the material was manually broken up in the field to ensure ACM was not present within soil clods etc and sieved where possible. The sample taken for Fibrous Asbestos (FA) and Asbestos Fines (AF) analysis included combination of sieved and manual inspected soil/rock.

Where the soil conditions resulted in the generation of dust (that is, in the presence of loose, dry soil) during the sampling process, the sampling location and samples were moistened with water applied as a fine mist to minimise the potential for dust generation during the sampling process;

7.1.4 Airborne Fibre Monitoring

Based on information from previous assessments, the site was known to contain ACM in the form of non-friable sheet materials. Furthermore, data collected in June 2007 by Robson indicated the presence of asbestos fibres.

Where bonded asbestos materials are considered to be potentially friable when removed, airborne fibre monitoring is recommended as it is good occupational hygiene practice as stipulated in the Safe Work Australia Code of Practice (2011) *How to Safely Remove Asbestos.*

Therefore, airborne asbestos fibre monitoring was implemented to assess whether respirable asbestos fibres were detectable during the removal of asbestos materials from the site. During the removal works representative airborne fibre monitoring locations were chosen adjacent to the removal works. Fibre monitoring pumps were generally located in common areas (lunch room, the site office), the decontamination unit and on the north, east, south and south boundaries of the work area and in the cabin of one of the operational excavators or bobcat.

Airborne fibre monitoring was conducted daily during all site activities including background monitoring prior to the commencement of site works from 13 November through to 18 December 2014).

The monitoring was undertaken using the following sampling equipment:

- Battery powered pump;
- Clean connecting hose;
- Membrane filters (mixed ester of cellulose) with a 0.8 micro millimetre (µm) pore size;
- Open face plastic filter holders.

The filter membranes were analysed at Robson's in-house NATA endorsed laboratory in accordance with '*Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust*' (NOHSC: 3003, 2005) for both exposure and control sampling. Certified laboratory reports for the airborne fibre monitoring are provided in **Appendix G.**

7.2 The Sampling and Analytical Plan

The Sample and Analytical Plan as proposed in the SAQP is presented below in **Table J.**

Table J: Sample and Analytical Plan.

Location	Rate or Number of Samples Proposed	Analytes
Asbestos Dump 0.45 ha	Fifteen (15) test pits within the presumed dump footprint Three (3) samples per test pit – two (2) in fill and one (1) in natural	Eight (8) metals and asbestos (all samples); TRH, BTEX, PAH, Phenols, OCP, PCB (1 per test pit) Pathogens: E coli, Faecal Coliforms and Total Coliforms (to be included adjacent the Septic Tank).
	Seven (7) test pits down gradient within the drainage line and three (3) test pits up gradient from the dump. Two (2) samples per test pit – one (1) surface and one (1) in natural (additional samples to be taken if extensive fill is observed	Eight (8) metals and asbestos (all samples); TRH, BTEX, PAH, Phenols, OCP, PCB (1 per test pit)
	2 per every second test pit (one(1) of fill material and one (1) of natural soil)	CEC, organic carbon, clay content, iron and pH
QA/QC Samples	Duplicate samples One (1) duplicate per 10 primary samples and one (1) triplicate per 20 primary samples and one (1) rinsate per field day. One (1) trip spike and one (1) trip blank per sample batch	PAHs, eight (8) metals and asbestos Trip blank and trip spike – BTEX and TRH C_6-C_9 only.

Notes:

- **TRH**: Total Recoverable Hydrocarbons; **BTEX**: Benzene, Toluene, Ethylbenzene, Xylenes; **PAH**: Polycyclic Aromatic Hydrocarbons; **PCB**: Polychlorinated biphenyls; **OCP**: Organochlorine Pesticides; **Heavy Metals**: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc;
- Cation Exchange Capacity (CEC), pH and clay content analyses are required for the derivation of EILs in accordance with the ASC NEPM (2013).
- If other contaminant sources are identified the analytical suite may need to be altered e.g. evidence of sludge from the septic tank, municipal waste etc.
- Based on what is observed in the trenches connecting test pits additional samples may be warranted.

8 VEGETATION AND ASBESTOS REMOVAL

The following section is specific to the removal of the vegetation cover, the broken asbestos sheeting (a non-friable asbestos containing material (ACM)), from the soil surface that included fill soil where the asbestos sheet could not be easily separated.

Site photographs are presented in **Appendix D** of this report.

A chronological summary of the vegetation and asbestos removal and subsequent ESA works is presented in **Table K** below and are described in detail in the subsequent pages in this section and **Section 9.**

In accordance with the RAP the work area (the site) was set up as an asbestos removal area in accordance with NOHSC (2002, 2005) *'Code of Practice for the Safe Removal of Asbestos – 2nd Edition'.* And during the remedial works airborne fibre monitoring was undertaken on daily basis in accordance with NOHSC (3003, 2005) '*Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust*'.

Table K. Summary of Field and Remedial Works

Stage	Date	Activity / Fieldwork	Contamination Summary
1-1 – Site Setup	October – 21 November 2014	Clear vegetation to establish site access road and the site compound.	None identified
1-1A – Site Setup and background airborne fibre monitoring	13 – 19 November 2014	Background airborne fibre monitoring prior to the commencement of remedial works to establish baseline with regard to fibre concentrations.	All results less than 0.01 F/ml)
1-2 and 1-3 Removal of blackberry and other vegetation and ACM as required	21 November – 1 December 2014	Remove vegetation and stockpile on site. **Note:** All vegetation removed with roots was stockpiled together to be treated as contaminated.	Surface ACM identified

Stage	Date	Activity / Fieldwork	Contamination Summary
1-3 - Removal of the ACM as required	21 November – 8 December 2014	Remove ACM sheet material and ACM impacted soil.	Surface ACM identified
1-4 – Environmental Site Assessment	4 December 2014; and 8 December -12 December 2014.	Soil sampling from test pits and trenching for the purpose of determining fill type between test pits locations	Asbestos sheet fragments were identified in Test Pits 3, 5, 6, 8 and 13. Low level hydrocarbon contamination was identified in TP 8 (negligible), TP 11 and TP13. Lead concentrations exceed the Solid Waste Criteria without leachability data: TP3, TP4, TP5, TP12, TP13 and TP15. Nickel concentrations exceed the Solid Waste Criteria without leachability data: TP1, TP9, and TP10.
1-4A – Temporary site shutdown	15 December -18 December 2014	Remove roots from the stockpiled and place within the 'AD' vegetation and wood chip the remaining waste for on site use. Seal disturbed soils, compound gravels and access road with a bituminous sealant.	ACM remains below the surface within the 'AD' boundary.

8.1 Vegetation Removal

The vegetation removal included the removal and stockpiling of blackberry vine, small and mature trees as required to enable the removal of surface ACM where found. The vegetation removal works were undertaken in accordance with the ACTPLA approved *Tree Management Plan Landscape Plan* (DSB Landscape Architects 24 March 2014) for the site. Therefore, apart from a few large trees in the centre and toward the west side of the site all of the vegetation cover was removed.

The vegetation removal was undertaken by the AAC and Irwin and Hartshorn between 21 November and 1 December 2014. A suitably qualified and experienced environmental scientist and ACT Licensed Class A Assessor from Robson was also on site to undertake airborne fibre monitoring during the removal works to monitor the removal and stockpiling of the vegetation.

Vegetation that had significant amounts of soil bound to the roots was deemed to have a significant risk of asbestos in soil and was therefore stockpiled separately. A bobcat was used to remove the blackberry vine while a 30 tonne excavator was used to remove trees as required. All vegetation was stockpiled on the grassed area on the east side of the work site.

The soil below vegetation was moist which helped to limit the dust emissions during the removal process and therefore while water was available at all times as a mechanism for dust suppression it was only used as required. As the vegetation was removed the asbestos sheet material as it was found on the surface was kept wet until it could be removed by the ACT licensed Asbestos Removalist.

The majority of the asbestos found was non-friable broken asbestos corrugated roof sheet and it was located in the central east part of the 'AD' and is described in the following sections.

8.2 Surface ACM Removal

Surface ACM removal commenced on 21 November and was completed on 8 December.

During and following the vegetation removal all visually identifiable ACM was handpicked and placed in asbestos waste bags by the ACT licensed asbestos waste contractor AAC. The volume of ACM removed in this way was minimal as there were large quantity of fragments and it was determined that it would be more efficient to remove the ACM with an excavator and load it directly into a leak proof truck for transport to the Mugga Lane Resource Management Centre (MLRMC). The majority of the ACM was removed in this way and is described in the next section.

8.2.1 Asbestos in Soil Removal

The direct loading of ACM fill material into trucks commenced on 28 November 2014 with the last load recorded as being transported to the Mugga Lane Resource Management Centre (MLRMC) on 9 December 2014 (Refer **Appendix C**).

The ACM impacted fill also included brick, tile, ash, metal, glass and plastic and depending on the transport vehicle it was either loaded into a double plastic lined truck tray and wrapped so that the ACM was sealed during transport to the landfill or placed directly into a leaked proof covered truck. Both methods were considered suitable and in accordance with ACT ESDD (2014) '*Information Sheet 5 Requirements for the transport and disposal of asbestos contaminated wastes'.*

Based on the tip dockets provided to Robson by Capcorp and AAC, 328.38 tonnes (t) of asbestos impacted soil was disposed to MLRMC. All truck movement and estimated volumes based on truck capacity reconciles with Robson field tracking records. Robson estimated that 174 m^3 which equates to 323.6 t using a clay density of 1.86 t/m^3 as referenced from the Australasian Institute of Mining and Metallurgy (1995) '*Field Geologist Manual'* was removed from the site.

9 FIELD WORK OBSERVATIONS

The ESA field work observations are described below. Refer to **Figure 4** at the rear of this report for the soil sample location plans related to this assessment.

The PID results and soil descriptions of samples taken are shown in the test pit logs presented in **Appendix E** of this report.

9.1 Test Pits

A suitably qualified and experienced environmental scientist and an ACT Licensed Class A Assessor from Robson supervised the excavation and sampling of the 25 test pits and four (4) trenches across the site. The field work was undertaken between 4 and 12 December 2014. The aim of the test pit work was to excavate 0.5 mbgl into the natural substrate where possible to characterise the fill across the site. Each test pit location was surveyed prior to undertaking the investigative works on 2 December 2014 by 4D Surveying. During the excavation of each test pit the surface was surveyed prior to the start of excavation and then the relative levels (RLs) were recorded for each sample horizon to assist with calculating the sample depth (provided it was safe to do so) (refer to **Figure 4** for Test Pit and Trench locations).

In general asbestos cement sheet fragments from broken corrugated roof sheet were observed in the soil at varying concentrations and depths in TP3, TP5, T6, TP8 and TP13. Where the asbestos was observed the fill was also noted to contain metal, glass, plastic, brick, tile, slag, ash and wood fragments. In test pits where the fill was dominated by brick, tile, minor ash and slag asbestos material was not observed.

Based on observations made during test pitting ACM appears to be primarily to be present within the top metre of fill. Pockets of ACM were found to be concentrated in particular locations for example TP13 and TP 6 where it was found to be at 3 mbgl.

The fill ranged in depth from no fill being present on the west side of the site to as deep as 5.5 mbgl at TP14 which is located on the northeast side of the site. The fill in the centre of the site ranges in depth from 0.5 mbgl to 4.5 mbgl.

A pocket of fill was also identified off site down gradient from the site wiithin Block 1 of Section 127 but no ACM was observed at this location.

Water inflows were observed in test pits TP8 and TP10. Based on the observed sudden inflow of water into the test pit, particularly TP10 at 4.6 mbgl and as the site had received a recent significant rainfall the water is thought to be seepage water/ a perched lens and not regional groundwater. With regard to contamination odours or staining on the surface of the water was not observed therefore samples were not deemed to be necessary. If significant water is identified during Stage 2 remediation works the water will be sampled and analysed for the site specific contaminants of concern and the data assessed against the relevant criteria specific to the receiving waters as defined in the Stage 2 RAP and/ or for off site disposal (if required).

During the sampling a duplicate of each sample was screened in the field with a hand-held MiniRae® 2000 Photoionisation Detector (PID) for Volatile Organic Compounds (VOCs). The PID results ranged from 0.0 ppm – 4.7 ppm (TP21) which suggests that the likelihood of significant concentrations of VOCs is low.

The natural soils may be described generally as either a sandy Clay, orange to red, exhibiting medium plasticity with minor medium grained gravels or a yellow

weathered granite. Based on a previous investigation (Robson reference 3144_ CL_EI Final_20061018) the natural soil on the east side of the 'AD' was described as either a yellow, brown silty clay or a yellow weathered siltstone.

9.2 Trench Observations

In accordance with SAQP following the completion of the test pit and sampling work four (4) north – south oriented trenches were excavated with the aim of joining the test pits to assess the heterogeneity of fill between the test pits.

The trench excavation work was undertaken on 12 December 2014. On average the trenches were one (1) metre wide, between two (2) and three (3) metres deep and their length varied from While survey points were recorded along the sides of the trenches the base of the trenches were not surveyed as access was not possible for safety reasons (Refer **Figure 4**).

Trench 1

Trench 1 connected test pits TP6, TP4, and TP5 and was approximately 42 m long. Natural soil was observed at the southern end near TP6. A high concentration of brick was observed adjacent the Septic Tank. Natural soil was observed at approximately 1 mbgl in the creek. Minor ACM was observed in the surface soil within the trench.

Trench 2

Trench 2 connected test pits TP6, TP7, TP8, TP9 and TP10 and was approximately 80 m long. Natural soil was observed at the southern end near TP6. Brick and ash was observed between TP6 and TP7. High brick content with a natural organic clay base near TP8. High brick content between TP8 and TP9. Between TP9 and 10 the substrate is dry with some ash and was considered to be consistent with the test pits. Brick and ash was observed on the north side of TP10. In summary Trench 2 did not exhibit signs of significant contamination. No ACM was observed in the walls or the base of the trench however some fragments were observed on the surface of the spoil but these were not thought to have come from below ground but are thought to have been material left following the surface removal of ACM.

Trench 3

Trench 3 connected test pits TP11, TP12 and TP13 and was approximately 57 m long. Natural soil was observed at the southern end and continued to be observed between and near TP11 and TP12. ACM and brick were observed between TP12 and TP13. The ACM mostly present in the upper layers with brick and minor ACM and the natural soil horizon below. ACM and Brick continued to be observed near TP13 and north of TP13. Other than the ACM observed near and north of TP13 no other indicators of significant contamination was observed.

Trench 4

Trench 4 connected test pits TP16, TP15 and TP17 and was approximately 55 m long. Ash was observed in the surface layer at the south end but for the soil was found to be mostly natural across the transect while one (1) piece of ACM was observed on the surface at the north end likely to have been transported from the high ACM area to he southeast during the general site works.

Further, no odours or visual observations related to putrescible waste were made. Therefore the likelihood of landfill gases to be present in the AD is considered to be low.

10 LABORATORY ANALYSIS AND ANALYTICAL RESULTS

10.1 Laboratory Analysis

Soil samples (including field QA/QC samples) were submitted to SGS Laboratories (SGS), Alexandria, NSW (primary laboratory) and Envirolab Services Pty Ltd (Envirolab), Chatswood, NSW (secondary laboratory). Both SGS and Envirolab are NATA accredited for the analysis performed and are able to provide results that are below the selected assessment criteria.

The limits of laboratory reporting (LOR) for the analytical methods used by the primary laboratory were compared with the proposed assessment criteria. This was to ensure that the assessment criteria values exceeded the laboratory LOR. The results of the comparison are presented in Section 5 in **Table E** and **Table F.**

Certified laboratory reports, sample receipt advice and COC documentation are included in **Appendix F** while the airborne fibre monitoring results are included in **Appendix G**. The laboratory analysis undertaken comprised the following:

Primary soil samples

In accordance with the SAQP the follow sample analysis was undertaken. The proposed analytical plan was varied slightly (refer **Table K** in **Section 7.2**) to accommodate the field conditions and are presented in **Table L** below:

Table L: Analytical Plan.

Location	Number of Soil Samples	Analytes
Asbestos Dump Approximately 0.45 ha	23	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) and asbestos.
	19	Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) and asbestos.
	4	Asbestos
	4	TRH and PAH
	4	PAH, Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) and asbestos only;
	15	Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), asbestos and CEC, organic carbon, clay content, iron and pH.

Location	Number of Soil Samples	Analytes
	1	E.coli, Faecal Coliforms and Total Coliforms, Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) and asbestos.
	1	TRH, BTEX, PAH, Phenols, OCP, PCB, Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), asbestos and CEC, organic carbon, clay content, iron and pH.
QA/QC Samples	Duplicate samples Five (5) Intra – lab Five (5) Inter - lab	Duplicates: PAHs, eight (8) metals and asbestos
	Four (4) trip spike and four (4) trip blank per sample batch	Trip blank and trip spike – BTEX and TRH C_6-C_9 only.

Notes:

- **TRH**: Total Recoverable Hydrocarbons; **BTEX**: Benzene, Toluene, Ethylbenzene, Xylenes; **PAH**: Polycyclic Aromatic Hydrocarbons; **PCB**: Polychlorinated biphenyls; **OCP**: Organochlorine Pesticides; **Heavy Metals**: Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc;
- Cation Exchange Capacity (CEC), pH and clay content analyses are required for the derivation of EILs in accordance with the ASC NEPM (2013).

In summary, soil samples were taken from a total of 25 grid based sample locations from the site which was in general accordance with the sample design as set out in the SAQP.

Sample locations were located across the footprint of the 'AD' based on systematic sampling pattern. In accordance with Table A of NSW EPA (1995) '*Sampling Design Guidelines*' a minimum of approximately thirteen (13) systematic sample points would be required for a site covering the combined site area of 4,500 m^2 to identify a hotspot of approximately 23.1 m diameter with 95 % confidence. In this case 16 locations were located within the area of presumed impact, while six (6) sample locations were located down gradient within the drainage line and three (3) up-gradient on the east side of the 'AD'. This number of sample locations achieved for this investigation was deemed to satisfy the proposed required sample density for the site.

<u>Duplicates Samples</u>

- Ten (10) duplicate samples (QC1 – QC10) were taken during the course of the project. Of the ten (10) duplicate samples five (5) were inter-lab duplicates and five (5) were intra-lab duplicates. The analytes selected for these samples were

dependent on the parent sample and represented some or a representative of the analytes selected;

- 71 primary samples were taken from the 25 test pits locations across the site between 4 December and 12 December 2014. In that time period there were a total of four (4) sampling days. Based on the proposed QA/QC program an intra-duplicate lab duplicate was to be taken 1 per 10 samples and an inter-lab duplicate was to be taken 1 per 20 samples. Therefore, the number of inter-lab duplicates is one (1) above the required number samples which is four (4) while the number of intra-lab duplicates is two (2) below the required number. Based on this outcome Robson considers the numbers of duplicates taken for this project to be satisfactory and will provide adequate information with regard to the project reliance on the laboratories analytical methodologies. Further, the number of duplicates taken meets the Australian Standard AS4482.1 which requires an inter-lab and an intra-lab duplicate to be taken every 20 samples.

Trip Blanks and Trip Spikes

- Four (4) trip blanks (laboratory supplied water in BTEX vial) and were analysed for BTEX and TRH fraction $C_6 – C_9$.
- Four (4) trip spikes (laboratory supplied BTEX spiked water in a BTEX vial) and were analysed for BTEX and TRH fraction $C_6 – C_9$.

The QA/QC program required a Trip Spike (TS) and Trip Blank (TB) to be taken with each sample event (per field day). On this project there were a total of four (4) sampling days and a total of three (3) sample transport events. Therefore, the number of TS and TB samples meets the QA/QC program. Therefore Robson concludes this is adequate to enable the assessment for the potential of cross contamination in the field and during transport and to measure the potential for volatile loss in transport.

Rinsate

- Two (2) rinsate samples were taken over the course of the project. The analytes selected for analysis were dependent on the potential contaminants of concern specific to that sampling event.

The QA/QC program required a Rinsate (R) to be taken with each sample event (per field day). On this project there were a total of four (4) sampling days and a total of two (2) sample transport events. Therefore, the number of rinsate samples does not meet the QA/QC program. However, it is noted as the majority of samples were taken with a clean disposable glove from the centre of the excavator bucket and therefore Rinsate samples were only taken when deemed necessary. As Rinsates samples were taken on at least two (2) of the four (4) sampling days Robson concludes this is adequate to assess the effectiveness of the decontamination procedures used for re-usable equipment including disposable gloves.

In general all Quality control (QC) samples were labelled with no reference to the primary sample on the sample container or COCs to ensure analytical results were not biased by the laboratory. In addition, all samples were clearly labelled with a unique identifier and were placed in an ice cooled esky with COC documentation for transport to a NATA accredited laboratory.

10.2 Comparison of Analytical Results to the Site Assessment Criteria

10.2.1 Land Use

Laboratory analytical results for the primary soil samples, the calculation of ACM concentrations and the EIL criteria for metals calculation work sheet are provided in specific tables, **Table 1** to **5** in the rear of this report. Samples where the contaminants of concern exceed the assessment criteria or are of significance are summarised below and the implications of these results are discussed in more detail in **Section 10.**

Asbestos

Suspect asbestos sheet fragments were either presumed and / or determined to be positive for asbestos by laboratory analysis in Test Pits, TP3, TP5, TP6, TP8 and TP13. The concentration of asbestos sheet materials in these test pits based on field analysis ranged from 0.06 weight percent per weight (% w/w) in TP6 (3 m) to 1.17 (% w/w) in TP13 (0.0-0.1 m) which exceeded the site assessment criteria of 0.04 % w/w. Asbestos fragments greater than (>) two (2) millimetres (mm) and less than (<) 7 mm was identified in sample TP8 (0.9 - 1.0m) at a concentration of (0.028 % w/w); TP13 (0.0 - 0.1 m : 5.7 % w/w) and TP13 (1.9-2.0 m: 0.046 % w/w). These also exceeded the assessment criteria of 0.04 % w/w with the exception of TP8 (0.9 - 1.0m). Fibrous Asbestos (FA) and Asbestos Fibre (AF) (<2 mm) was also detected in TP13 (0.0-0.1 m : 0.37 % w/w) and TP13 (1.9-2.0 m : 0.053 % w/w) which exceeds the assessment criteria of 0.001 % w/w. While soil samples were not taken during the trenching work the trenching confirmed the presence of ACM around test pits as identified above.

Airborne Fibre Monitoring

Airborne asbestos fibre monitoring was implemented to assess whether respirable asbestos fibres were produced during the onsite works and whether they were leaving the site boundary. During the assessment works airborne fibre monitoring locations where chosen in common areas (lunch room, the site office), the decontamination unit located at the entry and exit to the site, on the north, east, south and south boundaries of the work area and in the cabin of one (1) of the operational excavators or bobcat. In addition, a field blank was also collected.

In summary, the airborne fibre results were below the minimum practical detection limits of 0.01 fibre per millilitre of air (f/ml). The results of the airborne fibre monitoring indicate that during the assessment works undertaken at the site, it is considered unlikely that asbestos fibres have become airborne at significant concentrations.

Copies of the NATA endorsed laboratory report for the analysis of the airborne fibre monitoring samples are provided in **Appendix G**.

TRH, BTEX and PAHs

All samples returned results below the laboratory limit of reporting (LOR) apart from samples TP8 (0.0-0.1m), TP11 (0.0-0.1 m) and TP13 (0.0-0.1 m); (0.9-1.0 m); (1.9-2.0 m) and (2.9-3.0 m). TP8 and TP13 were located in the central part of the 'AD', while TP11 was located on the south boundary of the 'AD'.

TP8 (0.0-0.1 m) returned a very low concentration of 47 mg/kg for TRH (C_{15} – C_{28}) and 46 mg/kg for TRH (C_{29} – C_{36}) which do not exceed any of the assessment criteria for hydrocarbons and therefore these results are not of concern.

TP11 (0.0-0.1 m) returned a concentration of 200 mg/kg for TRH F3 (C_{16} – C_{34}) which is below the assessment criteria of 1,300 mg/kg and a TRH sum total of 250 mg/kg (C_{10} – C_{36}) which is not of concern.

Four (4) soil tests down the profile in TP13 (0.0-3.0 m) returned a concentration range of below the laboratory limit of detection (<90 mg/kg) to 630 mg/kg for TRH F3 (C_{16} – C_{34}) which is below the assessment criteria of 1300 mg/kg and a TRH sum total range of < 110 mg/kg to 630 mg/kg (C_{10} – C_{36}) which is not of concern.

TP13 (0.0-0.1) returned a concentration of 9.5 mg/kg for Benzo (a) Pyrene and 170 mg/kg for the sum total of Polycyclic Aromatic Hydrocarbons (PAHs). While the total concentration of 170 mg/kg for PAHs does not exceed the assessment criteria of 400 mg/kg for HIL B the concentration of 9.5 mg/kg does exceed the assessment criteria of 4 mg/kg for HIL B and the ESL criteria of 0.7 mg/kg. The elevated concentration of Benzo (a) Pyrene was not identified down the profile of TP13 nor was it identified at other test pit locations. The implications of this result are discussed further in **Section 10.**

Heavy Metals (As, Cd, Cu, Cr, Hg, Pb, Ni and Zn)

Concentrations of heavy metals were detected in all samples analysed. The concentrations did not exceed the HIL B assessment criteria while the EIL assessment criteria was exceeded for Zinc (451 mg/kg) in two (2) of the soil samples analysed returning concentrations of 520 mg/kg (TP6 – 1.9 – 2.0 m) and 470 mg/kg (TP8 - 0.9 -1.0 m). The implications of these results are discussed further in **Section 10.**

Speciated Phenols, OCP and PCB

TP13 (0.0-0.1 m) returned a concentration of 1 mg/kg for the OCP Dieldrin which is well below the assessment criteria of 10 mg/kg for Aldrin and Dieldrin.

All other samples returned concentrations of speciated phenols, OCP and PCB that were either below the laboratory limit of detection (LOR) or well below the assessment criteria.

10.2.2 Waste Criteria

TRH, BTEX and PAHs

The samples returned concentrations of TRH, BTEX and PAHs that were either below the laboratory limit of detection (LOR) or where concentrations of these contaminates were identified the concentrations did not exceed the Inert Waste Classification Criteria.

Speciated Phenols, OCP and PCB

The samples returned concentrations of Speciated Phenols, OCP and PCB that were either below the laboratory limit of detection (LOR) or where concentrations of these contaminates were identified the concentrations did not exceed the Inert Waste Classification Criteria.

Asbestos

Asbestos was detected in Test Pits TP3, TP5, TP6, TP8 and TP13 at the surface and to a depth of 3.2 m at Test Pit 13. As a concentration threshold has not been established with regard to waste where asbestos has been detected the asbestos and related soil or fill if it cannot be separated from the asbestos must be treated as asbestos waste. In accordance with the ACT Waste Classification Guidelines (Environment ACT (2000) '*Environmental Guidelines: Assessment & Classification of Liquid & Non-Liquid Wastes*';) asbestos waste is classified as Industrial Waste in the ACT but it may be disposed of to the MLRMC. Alternatively, asbestos waste may be disposed of at WBRMC provided there are no potential contaminants that exceed the assessment criteria for commercial / industrial sites.

Heavy Metals (As, Cd, Cu, Cr, Hg, Pb, Ni and Zn)

Of the heavy metals tested only lead (Pb) and/or nickel (Ni) concentrations exceeded the Solid Waste Classification Criteria without leachability data for soil samples taken from TP1, TP4, TP5, TP9, TP10, TP12, TP13 and TP15. Therefore, if the waste was to be disposed of to a licensed landfill in the ACT further sampling and leachate analysis for lead and nickel prior to disposal would be required.

10.2.3 BRU Criteria

Apart from asbestos the concentrations of the contaminants of potential concern did not exceed the BRU assessment criteria specific for Commercial and Industrial land use HIL 'D' (ASC NEPM 2013) (from a chemical contamination perspective only). Aesthetic and Geotechnical considerations would also need to be taken into account. For example, brick or concrete is not considered to be BRU but provided it is not contaminated it could be recycled.

10.3 Quality Control Results

10.3.1 Field QA/QC

Duplicates

As highlighted previously, five (5) intra-lab duplicate (triplicates) samples and five (5) inter-lab duplicates (triplicates) sample were collected and analysed to assess the reproducibility of the sampling procedures and the laboratory analytical methods used. This was assessed via calculation of the Relative Percentage Difference (RPD) for a primary soil sample and the corresponding field duplicate / triplicate samples. The calculation of the RPDs is a method of normalising two (2) values and allows a comparison between values and represents the differences between the primary and QC sample, divided by the average of the two (2) results expressed as a percentage. The RPD is calculated using the following formula:

$$\text{RPD} = \frac{\text{Result No. 1} - \text{Result No. 2} \times 100}{\text{Mean result}}$$

Calculated RPD results would be considered acceptable when the value is less than 50 % (if the result is five (5) times greater than the LOR)). Should the RPD value exceed 50 %, then further investigation to the cause of the difference between the primary and QC results would be undertaken.

The analytical results and calculation of the RPDs for the duplicate pairs are presented in **Table 2** with the data tables at the rear of this report. In summary, the calculated RPD values for the soil samples were all within the acceptable range with the exception of the following paired samples:

- QC2 (Triplicate) and TP23 (0.0-0.1) (Parent) returned an RPD of 58 % for nickel, while all other analytes for this pair were equal to or below the acceptable RPD of 50 %;
- QC3 (Duplicate) and TP5 (0.0-0.1) (Parent) returned an RPD of 53 % for lead while all other analytes for this pair were below the acceptable RPD of 50 %;
- QC7 (Duplicate) and TP14 (0.9-1.0) (Parent) returned an RPD of 141 % for Zinc and 64 % for lead while all other analytes for this pair were below the acceptable RPD of 50 %;
- QC8 (Triplicate) and TP14 (0.9-1.0) (Parent) returned an RPD of 147 % for Zinc and 57 % for nickel while all other analytes for this pair were below the acceptable RPD of 50 %;

The analytical results for QC5 (Duplicate) were compared to QC6 (Triplicate) to generate RPD results as the parent sample (TP 7(0.0-0.1)) was not analysed. The RPD of 50 % for the analytes tested was not exceeded for this pair.

These RPD exceedences above have occurred for one (1) or two (2) metals from a suite of eight (8) metals analysed. These exceedences may have occurred due to the heterogeneity of soil as all soil samples where the exceedences occurred were taken in the fill layer. In summary as these RPD exceedences only occurred with a small range of analytes within the sample, and based on the above explanations these exceedences are not considered to be of concern and the quality of the laboratory data is considered to be acceptable.

Rinsate, Trip Spike and Trip Blank

The analytical results for the rinsate samples, the trip spikes and the trip blanks samples are provided in **Table 3** with the data tables at the rear of this report. In summary, the results for the rinsate sample and the trip blank sample were all below the laboratory limit of reporting (LOR) for all analytes apart from concentrations of Mercury (0.0002 mg/L), Copper (0.003 mg/L) and Zinc (0.014 mg/L) in R1 and Copper (0.004 mg/L) and Zinc (0.02 mg/L) in R2. There are two (2) possible reasons for detectable concentrations in the rinsates:

a) the Rinsate water used as provided by the primary lab was contaminated (note based on our internal records (December 2014) SGS rinsate water exhibited detectable concentrations of copper, nickel and zinc above the concentrations recorded in both R1 and R2).

b) there may have been minimal cross contamination between samples during sample collection;

Further, based on discussion with a representative from the SGS (29 January 2015) low concentrations of metals are sometimes recorded in rinsate water that has been prepared specifically for low organic sampling which is a result of the preparation process (boiling). However, in this case there is no evidence that this type of rinsate water was used in this project.

In conclusion these concentrations of metals in the rinsate water are below site assessment criteria and are unlikely to have impacted on the analytical results for the project.

Concentrations of volatiles in the Trip Blanks and Trip Spikes were all below the laboratory detection limit therefore cross contamination whilst the samples were in transit between the site and the laboratory is assessed as unlikely.

The Trip Spike 1 (TS-1) was above 90 %, while TS-2 to TS-4 were greater than 100 % for the volatiles indicating that volatile loss was not significant during transport.

10.3.2 Laboratory Quality Control

The results of the laboratory internal quality control program are included along with the laboratory reports in **Appendix F**. The acceptable limits for the laboratory QA/QC are presented **Table M** below.

Table M: Summary of Acceptable Laboratory QA/QC Limits

Sample Type	Acceptable Limits
Surrogate Spikes	60% - 130%
Duplicate Sample	0% - 200% (if result is 5 times greater than the LOR)
Duplicate Sample	Any RPD is acceptable (if result is 5 times less than the LOR)
Laboratory Control Samples	60% - 140%
Matrix Spikes	70% - 130% (metals)
Method Blanks	Less than the LOR

In summary, the laboratory QA / QC results indicate the following:

- The laboratory duplicate sample analyses were within the acceptable limits with exception of the following:

  SE134169 – 1 Sample – SGS explanation: The result was less than five (5) LOR.

  SE134376 – 1 Sample – SGS explanation: Recovery failed acceptance criteria due to matrix interference.

  SE 134376 – 1 Sample - SGS explanation: Duplicate failed acceptance criteria due to sample heterogeneity.

  SE 134396 - 1 Sample - SGS explanation: Duplicate failed acceptance criteria due to sample heterogeneity.

- The spike and surrogate recovery results were within the laboratories acceptable range with the exception of the following:

  SE134169 – 2 Samples - Recovery failed acceptance criteria due to matrix interference.

  SE134376 - 2 Samples - Recovery failed acceptance criteria due to matrix interference and sample heterogeneity.

  SE134396 – 2 Samples - Recovery failed acceptance criteria due to matrix interference.

- The laboratory control samples, which were run with each batch of samples analysed, were within acceptable QC limits set by the laboratory;
- The concentrations of the laboratory blanks, which were run with each batch of samples analysed, were below the practical quantitation limits (PQL).
- Analysis of all samples was undertaken within sample holding times except for the following:

  SE134376 – Analyte pH – Samples TP7 (0.9-1.0) and TP7 (4.8-4.9) – Explanation: Laboratory error.

  SE134396 – Analyte pH – Samples TP9 (1.1-1.2); TP9 (3.9-4.0); TP11 (0.4-0.5); TP13 (1.9-2.0); TP13 (3.5-3.6); TP15 (0.9-1.0); TP17 (0.0-0.1) and TP17 (2.9-3.0) – Explanation: Laboratory error.

  SE134396A – Analytes TRH and PAH – Samples – TP11 (0.4-0.5); TP13 (0.9-1.0); TP13 (1.9-2.0) and TP13 (2.9-3.0) – Explanation: Requested analysis by Robson after the holding time had expired.

Based on the results of the implemented field quality control (calculation of the RPDs for the sample duplicate, triplicate pairs and the analytical results recorded for the rinsate, trip blank and trip spike samples) and the results of the internal quality control implemented by the laboratory, Robson considers the analytical results

provided in the laboratory reports to be acceptable for the purposes of this assessment.

11 DISCUSSION

11.1 Soil

Soil samples were analysed for a range of contaminants of potential concern (COPC) as identified in the SAQP. The COPCs include TRH, BTEX, PAHs, Speciated Phenols, OCP, PCB and Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) and asbestos.

Asbestos, heavy metals, TRH and PAH and asbestos were the COPCs detected in the fill soils across the site and the significance of these are discussed below.

Twenty five (25) grid based sample locations were excavated with an excavator to a target depth of 0.5 m into the natural soil horizon where possible across the site ('AD'). Of the 25, 16 locations were within the understood boundary of the 'AD' while six (6) were located down gradient within the drainage line and three (3) up gradient on the east side of the 'AD' outside the mounded vegetated area.

Site Soils

The results of the laboratory analysis for the site identified asbestos sheet materials in the test pits TP3, TP5, TP6, TP8 and TP13. Friable asbestos, FA and AF were identified in test pits TP8 and TP13.

Low concentrations of TRH and PAH were detected at test pit locations TP8, TP11 and TP13. Concentrations only exceeded the assessment criteria for Benzo (a) Pyrene (BaP = BaP TEQ) (4 mg/kg) at TP13 (0.0 - 0.1m) exhibiting a concentration of 15 mg/kg.

Due to the detection of TRH and PAH at these locations additional analysis of soil samples taken at depth which were held by the laboratory were submitted for analysis. The samples submitted included TP11 (0.4-0.5), TP13 (0.9-1.0), TP13 (1.9-2.0) and TP13 (2.9-3.0). Although these samples exceeded the NATA prescribed holding times and therefore the results would be technically unreliable, the aim of the analysis was to determine whether there was evidence of gross contamination. Further consideration was also given to the fact that the contaminants detected in the initial round of testing were the heavier fraction hydrocarbons (C_{16} – C_{36}) and BaP and the degradation of these hydrocarbon fractions and BaP is significantly slower than the lighter fractions (TRH C_6 - C_9). Therefore, it was considered useful to run these analyses despite the samples being analysed outside of the laboratory holding times.

Given this, similar concentrations of BaP were not detected at depth at TP13 and although low concentrations (below the assessment criteria) of TRH were detected to a depth of 3 m in this location these concentration are not considered to be of concern. The BaP TEQ concentration of 15 mg/kg is considered to be confined to the surface soils at this location. The extent of the elevated BaP TEQ has been delineated and does not warrant further investigation. Further, due to the presence ACM in this location and that the soils are likely be removed and disposed of asbestos waste which would be acceptable provided the waste went to WBMRC as the BaP concentration is well below the Commercial and Industrial land use criteria (HIL D) of 40 mg/kg. However, if the material was to be disposed of at an ACT licensed landfill as Solid Waste, leachability data of the BaP would be required.

All other contaminants of concern returned concentrations below the assessment criteria. However, when considering the site specific EILs for metals exceedences for zinc (451 mg/kg) were recorded in the fill soil at two (2) locations TP6 (1.9 - 2.0: 520 mg/kg) and TP8 (0.9-1.0: 470 mg/kg). As this is fill soil and is likely to be removed as part of the Stage 2 remediation works (to landfill) these exceedences are not considered to be of concern.

With regard to waste classification, lead and nickel concentrations were elevated in some locations and would require leachate analysis if the waste materials were to be disposed of to an ACT licensed landfill. However, if all material was to be disposed of to the West Belconnen Resource Management Centre (WBRMC) as asbestos waste leachate analysis would not be required as the metal concentrations do not exceed the Commercial and Industrial land use assessment criteria HIL D (ASC NEPM 2013) which is the appropriate land use criteria for the WBRMC site.

The principal contaminant of the concern is asbestos. Based on the assessment the asbestos is concentrated in the central and southeast portion of the dump. The asbestos where it was located ranged in depth from 0.5 mbgl at TP3 to a depth of 3.2 mbgl at TP13. Based on this information the asbestos impacted fill is confined to the upper layer within this area and is expected to occur at varying concentrations within the fill. The fill across the site covers a greater area than the asbestos contamination. Based on field observations the fill that is asbestos impacted has a high concentration of mixed-waste that includes soil, brick, tile, metal, glass, wood, ash and slag while the fill that does not appear to contain asbestos is dominated by brick, ceramic tile with some ash and slag. Based on these observations the asbestos is confined to the surface layer of the fill within a 1,260 square metre (m^2) area of the 'AD' while the fill covers a much larger area and is likely to extend beyond the visible boundary of the 'AD' toward the north and east of the site toward a Lane Poole Place and the Brickwork buildings. Therefore, based on the survey data collected during the assessment (Refer to **Figures 7 and 8**) the estimated volumes specific to the 'AD' of asbestos waste is approximately 2,610.1 m^3 while the estimated total volume of fill soil (soil, brick, tile, glass, metal ash and slag) including the asbestos is 8,732 m^3. These figures equate to a 4,854.8 t and 16,242 t respectively when using a clay density of 1.86 t/m^3 as referenced from the Australasian Institute of Mining and Metallurgy (1995) '*Field Geologist Manual'* and do not include the fill identified around TP22 and TP23 primarily because these locations are considered to be outside the 'AD' (the area to be remediated).

However, it must be noted that the derivation of these figures is based on field observations and interpolation between data points so a degree of uncertainty must be considered. If one extends the ACM fill boundary half way between the outlying unimpacted test pits the approximate area is 2,700 m^2 and assuming an average depth of 1.5 mbgl the volume of ACM fill could be as high as 4,050 m^3 which equates to approximately 7,533 t.

Extent of fill material

Fill consisting predominantly of brick and tile with ash and slag without ACM was also not only identified on Public Land down gradient (west) from the main concentration of the ACM but also to the north and the east of the site.

The fill to west of the 'AD' is either very shallow or not present (TP16, TP19, TP20 and TP21) and then is present again at TP22 and TP23 up to depths of 2.2 m (TP22). Therefore fill has encroached from the site onto Public Land Block 20 Section 102 and Block 1 Section 127. Further, while the boundary of the ACM impacted fill has been delineated, the boundary of the fill has only been partially delineated along the southern boundary of the site and fill exists to the north and east of the outer test pits within the site. It must be noted that while no ACM or other contaminants of concern were detected in these locations aesthetic and geotechnical considerations must be considered when assessing the suitability of the site for the proposed land use.

11.2 Asbestos Materials

As part of the Stage 1 Remedial Works Program on completion of the removal of the vegetation from the surface visible asbestos sheet materials were removed. Where the asbestos was severely fragmented and intermixed with the site's fill materials it was removed as asbestos contaminated waste. The aim of the removal was to reduce the risk of worker exposure to ACM during the investigative Phase of the project. This objective was largely met and resulted in the removal of 328 t by AAC the ACT licensed Asbestos Removal Contractor to the Mugga Lane Resource Management Centre (MLRMC) in Symonston ACT.

To limit the volume of ACM removed during Stage 1 works in locations where the fragmented ACM continued to be present below surface (greater than 0.5 mbgl) on completion of removal, these areas were made safe by covering them with approximately 200 mm of unimpacted soil from other sections of the site. As these high impact areas were small, the works to cover the ACM to 'make safe' was not significant and was done as part of the site reinstatement following the removal of the vegetation.

Airborne Fibre Monitoring

As part of the remediation monitoring, asbestos airborne fibre monitoring was undertaken on a daily basis during all site works and in summary, the airborne fibre results were below the minimum practical detection limits of 0.01 fibre per millilitre of air (f/ml). The results of the airborne fibre monitoring indicate that during the assessment works undertaken at the site, it is considered unlikely that asbestos fibres have become airborne at significant concentrations and there the dust controls measures implemented for the site were considered to be appropriate for the site works.

11.3 Groundwater

Depth to groundwater is unknown however what is believed to be seepage water/ perched water lens was observed in TP10 at 4.6 mbgl and water but to a lesser extent was also observed in TP8 at approximately 1.9 mbgl.

Based on the observed sudden inflow of water into the test pit, particularly TP10 at 4.6 mbgl and as the site had received a recent significant rainfall (53.6 mm between 1 and 7 December 2014 with 29.6 mm falling on 7 December 2014 was recorded at the Tuggeranong weather station by the Bureau of Meteorology) the water is thought to be seepage water/ a perched lens and not regional groundwater.

With regard to contamination odours or staining on the surface of the water was not observed.

12 CONCLUSIONS AND RECOMMENDATIONS

In summary, based on the results of the ESA the following conclusions and recommendations are made:

- The vegetation cover was successfully removed and stockpiled on the east side of the site
- During and following the vegetation removal 328.38 t of ACM was removed from site by an ACT licensed removalist (AAC) and disposed at the Mugga Lane Resource Management Centre;
- Airborne fibre monitoring was undertaken prior to and during all stages of activity undertaken within the work area. All airborne fibre results were below the minimum practical detection limits of 0.01 fibre per millilitre of air (f/ml). The results of the airborne fibre monitoring indicate that during the removal and the assessment works undertaken at the site, it is considered unlikely that asbestos fibres have become airborne at significant concentrations.
- While no odours or visual observations related to putrescible waste were made, the likelihood of landfill gases to be present in the 'AD' still remains a possibility until the waste has been removed.
- Water inflows were observed in test pits TP8 and TP10. Based on the observed sudden inflow of water into the test pit, particularly TP10 at 4.6 mbgl and as the site had received a recent significant rainfall the water is thought to be seepage water/ a perched lens and not regional groundwater.

  Note: if significant water is identified during Stage 2 remediation works, the water will be sampled and analysed for the site specific contaminants of concern and the data assessed against the relevant criteria specific to the receiving waters as defined in the Stage 2 RAP and/ or for off site disposal (if required).
- Non – friable asbestos containing material (ACM) is the principal contaminant of concern (intermixed with fill) and is present in the centre and southeast section of the 'AD' in the surface layer of the fill and appears to range in depth and concentration.
- Based on survey data the ACM impacted fill is estimated to cover an area of 1,260 m^2 while fill does not contain significant quantities of ACM covers an area of approximately 3,722 m^2. Based on depth horizons recorded for each of the 25 test pits these figures equate to approximately 2,610.1 cubic metres (m^3) (4,854.8 t) and 8,732 m^3 (16,242 t) respectively.

  However, it must be noted that the derivation of these figures is based on field observations and interpolation between data points so a degree of uncertainty must be considered. If one extends the ACM fill boundary half way between the outlying unimpacted test pits the approximate area is 2,700 m^2 and assuming an average depth of 1.5 mbgl the volume of ACM fill could be as high as 4,050 m^3 which equates to approximately 7,533 t;
- Low concentrations of other potential contaminants of concern were detected in the fill materials and these included TRH, PAHs: principally BaP TEQ and Heavy Metals. However, BaP TEQ was the only contaminant that exceeded the assessment criteria (BaP TEQ: 4mg/kg) at TP13 (0.0 - 0.1m) exhibiting a concentration of 15 mg/kg. As similar concentrations of BaP TEQ were not

detected at depth in this location or in other locations the exceedence was considered to be isolated and not of concern;

- The ACM impacted material would be suitable for disposal at the West Belconnen Waste Management Centre pending receipt of approval from ACT Environmental Standards (ES);
- The ACM impacted material would be suitable for disposal as asbestos waste at the Mugga Lane Resource Management Centre pending the receipt of leachate data specific to heavy metals (principally lead and nickel) and BaP and receipt of approval from Remondis (the landfill operator);
- The fill material that does not contain ACM does not exhibit contaminant concentrations that exceed the proposed land use criteria HIL B (high density residential land use) (ASC NEPM 2013). Therefore, if the ACM impacted fill can be successfully removed then the remaining fill would be suitable to remain on site. However, other considerations may need to be given to geotechnical and aesthetic requirements specific to the site. Therefore, if the remediation option is to leave clean fill (brick, tile with minor ash and slag) on site, it must be clear how this material is going to be managed from aesthetic point of view in the Stage 2 RAP. For example, this could include the installation of a marker layer (geo-fabric) and covering the material with EPA approved imported fill.

Based on this information Robson recommends that the data collected and assessed in this report is suitable for the refinement of the proposed Stage 2 remedial works as proposed in the current Remediation Action Plan (RAP) with the objective of rendering the site suitable for high density residential land use as defined by the '*National Environment Protection (Assessment of Site Contamination) Measure'* (NEPM as amended, May 2013).

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14 ABBREVIATIONS

Abbreviations	
ACL	Added Contaminant Limits
ACM	Asbestos Containing Material
ADWG	Australian Drinking Water Quality Guidelines
AEC	Area of Environmental Concern
AF	Asbestos Fines
AGST	Aboveground Storage Tank
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environmental and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard
ASC	Assessment of Site Contamination
AWQG	Australian Water Quality Guidelines
B(a)P	Benzo(a)Pyrene
BH	Bore Hole
BTEX	Benzene – Toluene – Ethylbenzene – Xylene
CMP	Contaminant Management Plan
COC	Chain Of Custody
CSM	Conceptual Site Model
CT	Contaminant Threshold
DBYD	Dial Before You Dig
DEC	Department of Environment and Conservation
DECCEW	Department of Environment, Climate Change, Energy and Water
DQO	Data Quality Objectives
EIL	Ecological Investigation Level

Abbreviations	
EPA	Environmental Protection Authority
EPP	Environmental Protection Policy
EPU	Environmental Protection Unit
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
FA	Fibrous Asbestos
g/kg	Grams per kilogram
GIL	Groundwater Investigation Levels
GMRRW	Guidelines for Managing Risk in Recreational Waters
HIL	Health Investigation Level
HM	Heavy Metal
HSL	Health Screening Level
ILs	Investigation Levels
Km	Kilometres
L	Litres
L/s	Litres per second
LOR	Laboratory limit of reporting
m	Metres
m^2	Metres square
mbgl	Metres Below Ground Level
mg/kg	Milligrams per kilogram
mg/L	Milligrams per Litre
MW	Monitoring Well
NA	Not available
NATA	National Association of Testing Authorities
NE	Not established

Abbreviations	
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	National Resource Management Ministerial Research Council
NSW	New South Wales
OH&S	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated biphenyls
pH	A measure of the acidity or basicity of an aqueous solution.
PID	Photoionisation Detector
PPE	Personal Protective Equipment
ppm	Parts per million
QA	Quality Assurance
QC	Quality Control
RAP	Remediation Action Plan
RPD	Relative Percentage Difference
SSMP	Site Safety Management Plan
TBD	To be determined
TDS	Total Dissolved Solids
TEQ	Toxicity Equivalence Quotient
TRH	Total Recoverable Hydrocarbon
ug/L	Micrograms per litre
UCL	Upper Confidence Limit
USEPA	United Stated Environmental Protection Agency
(% w/w)	Percent weight per weight

15 STATEMENT OF LIMITATIONS

The ESA was undertaken in order to part remediate and assess the Site located at Denman Street Yarralumla ACT - 'Asbestos Dump' Canberra Brickworks west side of Block 1 Section 102 Yarralumla following removal of vegetation cover, surface ACM / ACM impacted soil and separation of building materials miscellaneous concrete.

To the best of Robson's knowledge, our assessment of the data represents a reasonable interpretation of the general condition of the site. Under no circumstances, however, can it be considered that these findings represent the actual state of the entire site. In addition, the assessment did not include the direct sampling and analysis of soil vapour.

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TABLES

Tables 1 - 5

9623 - Table 1
TP1 - TP25
Soil Analytical Restults
Stage 1 ESA - Canberra Brickworks Remediation Project

Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP1 0.0-0.1	TP1 0.4-0.5	TP1 1.1-1.2	TP2 0.0-0.1	TP2 0.9-1.0	TP2 2.9-3.0	TP3 0.0-0.1	TP3 0.4-0.5	TP3 1.4-1.5	TP4 0.0-0.1
									Testpit Number	TP1	TP1	TP1	TP2	TP2	TP2	TP3	TP3	TP3	TP4
									Sample Depth	0.0-0.1	0.4-0.5	1.1-1.2	0-0.1	0.9-1	2.9-3	0-0.1	0.4-0.5	1.4-1.5	0-0.1
									Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	10/12/2014
									Lab Sample Number	SE134376.000	SE134376.001	SE134376.002	SE134376.004	SE134376.005	SE134376.006	SE134376.007	SE134376.008	SE134376.009	SE134376.018
	2346&2356-Tetrachlorophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<1	-	<1	-	-	<1	-	-	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<1	-	<1	-	-	<1	-	-	-
	Exchangeable Calcium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	80.7	65.4	-	-	-	-
	Exchangeable Magnesium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	13.4	28.2	-	-	-	-
	Exchangeable Potassium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	4.8	5.5	-	-	-	-
	Exchangeable Magnesium, Mg	meq/100g	0.02	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	0.98	3.8	-	-	-	-
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	**15[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**800|8000|8000|32000**	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	2,4,6-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**4|40|40|160**	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	2,4-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	2,6-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	2-chlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	Pentachlorophenol	mg/kg	0.5	**130[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
Inorganics	Exchangeable Calcium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	1200	1800	-	-	-	-
	Exchangeable Magnesium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	120	460	-	-	-	-
	Exchangeable Potassium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	140	290	-	-	-	-
	Exchangeable Sodium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	18	29	-	-	-	-
	pH (Lab)	pH_Units	0	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	7.5	6.4	-	-	-	-
	TOC	mg/kg	500	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	6100	2400	-	-	-	-
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	-	<0.001	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	<0.001	<0.001
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	-	<0.001	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	<0.001	<0.001
Metals	Arsenic	mg/kg	3	**500[1]**	**NE**	**104**	**NE**	**NE**	11	10	9	7	8	3	7	9	12	5
	Cadmium	mg/kg	0.3	**150[1]**	**NE**	**NE**	**NE**	**NE**	<0.3	<0.3	0.5	<0.3	<0.3	0.3	<0.3	0.5	0.4	<0.3
	Chromium (III+VI)	mg/kg	0.3	**500[1]**	**NE**	**630**	**NE**	**NE**	11	10	23	19	15	40	17	21	21	26
	Copper	mg/kg	v	**30000[1]**	**NE**	**86**	**NE**	**NE**	28	27	72	16	19	22	30	23	69	9.4
	Iron	mg/kg	50	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	15,000	40,000	-	-	-	-
	Lead	mg/kg	1	**1200[1]**	**NE**	**1131**	**NE**	**10|100|100|400**	25	24	57	60	24	59	24	58	470	50
	Mercury	mg/kg	0.01	**120[1]**	**NE**	**NE**	**NE**	**0.4|4|4|16**	<0.01	<0.01	0.4	0.03	0.03	0.02	0.01	<0.01	<0.01	0.02
	Nickel	mg/kg	0.5	**1200[1]**	**NE**	**169**	**NE**	**4|40|40|160**	44	34	18	14	19	13	19	12	11	6.3
	Zinc	mg/kg	0.5	**60000[1]**	**NE**	**451**	**NE**	**NE**	160	75	230	94	130	290	82	290	330	43
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	4,4-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	a-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Aldrin	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	b-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Chlordane (cis)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	gamma-Chlordane	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	d-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	DDD	mg/kg	0.1	**600**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	DDT	mg/kg	0.1	**600**	**NE**	**180**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Dieldrin	mg/kg	0.2	**10[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Endosulfan I	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Endosulfan II	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Endosulfan sulphate	mg/kg	0.1	**400**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Endrin	mg/kg	0.2	**20[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Endrin aldehyde	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Endrin ketone	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	g-BHC (Lindane)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Heptachlor	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Heptachlor epoxide	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Methoxychlor	mg/kg	0.1	**500[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	o,p-DDD	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	o,p'-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	trans-Nonachlor	mg/kg	0.1	**0.01[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
Pesticides	Isodrin	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Mirex	mg/kg	0.1	**20[1]**	**NE**	**NE**	**NE**	**NE**	-	<0.1	-	<0.1	-	-	<0.1	-	-	-

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Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP1 0.0-0.1	TP1 0.4-0.5	TP1 1.1-1.2	TP2 0.0-0.1	TP2 0.9-1.0	TP2 2.9-3.0	TP3 0.0-0.1	TP3 0.4-0.5	TP3 1.4-1.5	TP4 0.0-0.1
								Testpit Number	TP1	TP1	TP1	TP2	TP2	TP2	TP3	TP3	TP3	TP4
								Sample Depth	0.0-0.1	0.4-0.5	1.1-1.2	0-0.1	0.9-1	2.9-3	0-0.1	0.4-0.5	1.4-1.5	0-0.1
								Sample Date	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	10/12/2014
								Lab Sample Number	SE134376.000	SE134376.001	SE134376.002	SE134376.004	SE134376.005	SE134376.006	SE134376.007	SE134376.008	SE134376.009	SE134376.018
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	1-Methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	0.4	-	-	<0.1	-	-	-
	2,4-dimethylphenol	mg/kg	0.5	NE	NE	NE	NE	NE	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	2,4-dinitrophenol	mg/kg	2	NE	NE	NE	NE	NE	-	<2	-	<2	-	-	<2	-	-	-
	2-methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	0.6	-	-	<0.1	-	-	-
	2-methylphenol	mg/kg	0.5	NE	NE	NE	NE	400|4000|4000|16000	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	2-nitrophenol	mg/kg	0.5	NE	NE	NE	NE	NE	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	3-&4-methylphenol	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	2	NE	NE	NE	NE	NE	-	<2	-	<2	-	-	<2	-	-	-
	4-nitrophenol	mg/kg	1	NE	NE	NE	NE	NE	-	<1	-	<1	-	-	<1	-	-	-
	Acenaphthene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Acenaphthylene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Benz(a)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Benzo(a) pyrene	mg/kg	0.1	4[1]	0.7	NE	NE	0.08|0.8|0.8|3.2	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Benzo(g,h,i)perylene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Benzo(k)fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Chrysene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Cresol Total	mg/kg	1.5	4700[1]	NE	NE	NE	400|4000|4000|16000	-	<1.5	-	<1.5	-	-	<1.5	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Fluorene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Naphthalene	mg/kg	0.1	5[2]	NE	170	NE	NE	-	<0.1	-	<0.1 - 0.2	-	-	<0.1	-	-	-
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	4[1]	0.7	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	<0.2
	PAHs (Sum of total)	mg/kg	0.8	400[1]	NE	NE	NE	NE	-	<0.8	-	1.5	-	-	<0.8	-	-	-
	Phenanthrene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	0.1	-	-	<0.1	-	-	-
	Phenol	mg/kg	0.5	45000[1]	NE	NE	NE	28.8|288|288|1152	-	<0.5	-	<0.5	-	-	<0.5	-	-	-
	Pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1221	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1232	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1242	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1248	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1254	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1260	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1268	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Aroclor 1262	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	PCBs (Sum of total)	mg/kg	1	1[1]	NE	NE	NE	NE	-	<1	-	<1	-	-	<1	-	-	-
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	NE	NE	NE	1000	NE	-	<25	-	<25	-	-	<25	-	-	-
	C16-C34	mg/kg	90	NE	1300	1300	2500	NE	-	<90	-	<90	-	-	<90	-	-	-
	C34-C40	mg/kg	120	NE	5600	5600	10,000	NE	-	<120	-	<120	-	-	<120	-	-	-
	C6 - C9	mg/kg	20	NE	NE	NE	NE	NE	-	<20	-	<20	-	-	<20	-	-	-
	C10 - C14	mg/kg	20	NE	NE	NE	NE	NE	-	<20	-	<20	-	-	<20	-	-	-
	C15 - C28	mg/kg	45	NE	NE	NE	NE	NE	-	<45	-	<45	-	-	<45	-	-	-
	C29-C36	mg/kg	45	NE	NE	NE	NE	NE	-	<45	-	<45	-	-	<45	-	-	-
	+C10 - C36 (Sum of total)	mg/kg	110	NE	NE	NE	NE	NE	-	<110	-	<110	-	-	<110	-	-	-
	C10 - C40 (Sum of total)	mg/kg	210	NE	NE	NE	NE	NE	-	<210	-	<210	-	-	<210	-	-	-
	C6-C10	mg/kg	25	NE	NE	NE	NE	NE	-	<25	-	<25	-	-	<25	-	-	-
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	280[2]	120	120	NE	NE	-	<25	-	<25	-	-	<25	-	-	-
	TRH C37-C40	mg/kg	100	NE	NE	NE	NE	NE	-	<100	-	<100	-	-	<100	-	-	-
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	0.7[2]	65	65	NE	1|10|10|40	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Ethylbenzene	mg/kg	0.1	NE	125	125	NE	60|600|600|2400	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Toluene	mg/kg	0.1	480	105	105	NE	28.8|288|288|1152	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Total BTEX	mg/kg	0.6	NE	NE	NE	NE	NE	-	<0.6	-	<0.6	-	-	<0.6	-	-	-
	Xylene (m & p)	mg/kg	0.2	NE	NE	NE	NE	NE	-	<0.2	-	<0.2	-	-	<0.2	-	-	-
	Xylene (o)	mg/kg	0.1	NE	NE	NE	NE	NE	-	<0.1	-	<0.1	-	-	<0.1	-	-	-
	Xylene Total	mg/kg	0.3	110[2]	45	45	NE	100|1000|1000|4000	-	<0.3	-	<0.3	-	-	<0.3	-	-	-
	C6-C10 less BTEX (F1)	mg/kg	25	50[2]	180	180	700	NE	-	<25	-	<25	-	-	<25	-	-	-
Faecal Coliforms	Faecal Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	Escherichia Coli Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	Total Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats*'..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

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Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP4 0.9-1.0	TP4 1.9-2.0	TP4 3.6-3.7	TP5 0.0-0.1	TP5 1.1-1.2	TP5 1.9-2.0	TP5 4.1-4.2	TP6 0.0-0.1	TP6 1.9-2.0	TP6 3.4-3.5
									Testpit Number	TP4	TP4	TP4	TP5	TP5	TP5	TP5	TP6	TP6	TP6
									Sample Depth	0.9-1	1.9-2	3.6-3.7	0-0.1	1.1-1.2	1.9-2	4.1-4.2	0-0.1	1.9-2	3.4-3.5
									Sample Date	10/12/2014	10/12/2014	10/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	10/12/2014	10/12/2014	10/12/2014
									Lab Sample Number	SE134376.019	SE134376.020	SE134376.021	SE134376.010	SE134376.011	SE134376.012	SE134376.013	SE134376.022	SE134376.023	SE134376.024
	2346&2356-Tetrachlorophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	-	<1	-	-	-	<1	-	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	-	<1	-	-	-	<1	-	-
	Exchangeable Calcium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	80	-	52	-	-	-
	Exchangeable Magnesium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	14.2	-	44.4	-	-	-
	Exchangeable Potassium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	4.8	-	2.5	-	-	-
	Exchangeable Magnesium, Mg	meq/100g	0.02	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	1.5	-	5.3	-	-	-
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	**15[3]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**800|8000|8000|32000**	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	2,4,6-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**4|40|40|160**	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	2,4-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	2,6-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	2-chlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	Pentachlorophenol	mg/kg	0.5	**130[3]**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
Inorganics	Exchangeable Calcium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	1700	-	1200	-	-	-
	Exchangeable Magnesium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	180	-	640	-	-	-
	Exchangeable Potassium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	200	-	120	-	-	-
	Exchangeable Sodium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	24	-	27	-	-	-
	pH (Lab)	pH_Units	0	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	6	-	6.5	-	-	-
	TOC	mg/kg	500	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	15,000	-	500	-	-	-
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	<0.001	<0.001	<0.001	<0.001
Metals	Arsenic	mg/kg	3	**500[1]**	**NE**	**104**	**NE**	**NE**	3	10	4	7	9	8	3	5	5	6
	Cadmium	mg/kg	0.3	**150[1]**	**NE**	**NE**	**NE**	**NE**	0.7	<0.3	<0.3	0.4	0.5	<0.3	<0.3	<0.3	<0.3	0.4
	Chromium (III+VI)	mg/kg	0.3	**500[1]**	**NE**	**630**	**NE**	**NE**	9.2	21	15	18	21	18	30	22	21	18
	Copper	mg/kg	v	**30000[1]**	**NE**	**86**	**NE**	**NE**	8	25	14	25	51	35	13	14	12	42
	Iron	mg/kg	50	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	30,000	-	-	-
	Lead	mg/kg	1	**1200[1]**	**NE**	**1131**	**NE**	**10|100|100|400**	250	110	11	170	70	34	22	28	26	89
	Mercury	mg/kg	0.01	**120[1]**	**NE**	**NE**	**NE**	**0.4|4|4|16**	0.04	0.02	<0.01	0.04	0.19	0.16	0.01	0.03	0.01	<0.01
	Nickel	mg/kg	0.5	**1200[1]**	**NE**	**169**	**NE**	**4|40|40|160**	4.8	16	7.5	18	18	16	12	14	9.3	11
	Zinc	mg/kg	0.5	**60000[1]**	**NE**	**451**	**NE**	**NE**	110	120	83	260	250	270	93	26	**520**	260
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	4,4-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	a-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Aldrin	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	b-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Chlordane (cis)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	gamma-Chlordane	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	d-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	DDD	mg/kg	0.1	**600**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	DDT	mg/kg	0.1	**600**	**NE**	**180**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Dieldrin	mg/kg	0.2	**10[1]**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Endosulfan I	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Endosulfan II	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Endosulfan sulphate	mg/kg	0.1	**400**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Endrin	mg/kg	0.2	**20[1]**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Endrin aldehyde	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Endrin ketone	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	g-BHC (Lindane)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Heptachlor	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Heptachlor epoxide	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Methoxychlor	mg/kg	0.1	**500[3]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	o,p-DDD	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	o,p'-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	trans-Nonachlor	mg/kg	0.1	**0.01[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
Pesticides	Isodrin	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Mirex	mg/kg	0.1	**20[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	-	-	<0.1	-	-

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Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP4 0.9-1.0	TP4 1.9-2.0	TP4 3.6-3.7	TP5 0.0-0.1	TP5 1.1-1.2	TP5 1.9-2.0	TP5 4.1-4.2	TP6 0.0-0.1	TP6 1.9-2.0	TP6 3.4-3.5
								Testpit Number	TP4	TP4	TP4	TP5	TP5	TP5	TP5	TP6	TP6	TP6
								Sample Depth	0.9-1	1.9-2	3.6-3.7	0-0.1	1.1-1.2	1.9-2	4.1-4.2	0-0.1	1.9-2	3.4-3.5
								Sample Date	10/12/2014	10/12/2014	10/12/2014	9/12/2014	9/12/2014	9/12/2014	9/12/2014	10/12/2014	10/12/2014	10/12/2014
								Lab Sample Number	SE134376.019	SE134376.020	SE134376.021	SE134376.010	SE134376.011	SE134376.012	SE134376.013	SE134376.022	SE134376.023	SE134376.024
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	0.2	-	<0.1	-	<0.1	-	-
	1-Methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	2,4-dimethylphenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	2,4-dinitrophenol	mg/kg	2	NE	NE	NE	NE	NE	<2	-	-	<2	-	-	-	<2	-	-
	2-methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	2-methylphenol	mg/kg	0.5	NE	NE	NE	NE	400|4000|4000|16000	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	2-nitrophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	3-&4-methylphenol	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	2	NE	NE	NE	NE	NE	<2	-	-	<2	-	-	-	<2	-	-
	4-nitrophenol	mg/kg	1	NE	NE	NE	NE	NE	<1	-	-	<1	-	-	-	<1	-	-
	Acenaphthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Acenaphthylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Benz(a)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	0.2	-	<0.1	-	<0.1	-	-
	Benzo(a) pyrene	mg/kg	0.1	4[1]	0.7	NE	NE	0.08|0.8|0.8|3.2	<0.1	-	-	0.1	-	<0.1	-	<0.1	-	-
	Benzo(g,h,i)perylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Benzo(k)fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Chrysene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	0.1	-	<0.1	-	<0.1	-	-
	Cresol Total	mg/kg	1.5	4700[1]	NE	NE	NE	400|4000|4000|16000	<1.5	-	-	<1.5	-	-	-	<1.5	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	0.4	-	<0.1	-	<0.1	-	-
	Fluorene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Naphthalene	mg/kg	0.1	5[2]	NE	170	NE	NE	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-	-
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	4[1]	0.7	NE	NE	NE	<0.2	-	-	-	-	-	-	0.2	<0.2	
	PAHs (Sum of total)	mg/kg	0.8	400[1]	NE	NE	NE	NE	<0.8	-	-	2	-	<0.8	-	<0.8	-	-
	Phenanthrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	0.3	-	0.1	-	<0.1	-	-
	Phenol	mg/kg	0.5	45000[1]	NE	NE	NE	28.8|288|288|1152	<0.5	-	-	<0.5	-	-	-	<0.5	-	-
	Pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	0.3	-	<0.1	-	<0.1	-	-
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1221	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1232	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1242	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1248	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1254	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1260	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Arochlor 1268	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Aroclor 1262	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	PCBs (Sum of total)	mg/kg	1	1[1]	NE	NE	NE	NE	<1	-	-	<1	-	-	-	<1	-	-
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	NE	NE	NE	1000	NE	<25	-	-	<25	-	-	-	<25	-	-
	C16-C34	mg/kg	90	NE	1300	1300	2500	NE	<90	-	-	<90	-	-	-	<90	-	-
	C34-C40	mg/kg	120	NE	5600	5600	10,000	NE	<120	-	-	<120	-	-	-	<120	-	-
	C6 - C9	mg/kg	20	NE	NE	NE	NE	NE	<20	-	-	<20	-	-	-	<20	-	-
	C10 - C14	mg/kg	20	NE	NE	NE	NE	NE	<20	-	-	<20	-	-	-	<20	-	-
	C15 - C28	mg/kg	45	NE	NE	NE	NE	NE	<45	-	-	<45	-	-	-	<45	-	-
	C29-C36	mg/kg	45	NE	NE	NE	NE	NE	<45	-	-	<45	-	-	-	<45	-	-
	+C10 - C36 (Sum of total)	mg/kg	110	NE	NE	NE	NE	NE	<110	-	-	<110	-	-	-	<110	-	-
	C10 - C40 (Sum of total)	mg/kg	210	NE	NE	NE	NE	NE	<210	-	-	<210	-	-	-	<210	-	-
	C6-C10	mg/kg	25	NE	NE	NE	NE	NE	<25	-	-	<25	-	-	-	<25	-	-
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	280[2]	120	120	NE	NE	<25	-	-	<25	-	-	-	<25	-	-
	TRH C37-C40	mg/kg	100	NE	NE	NE	NE	NE	<100	-	-	<100	-	-	-	<100	-	-
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	0.7[2]	65	65	NE	1|10|10|40	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Ethylbenzene	mg/kg	0.1	NE	125	125	NE	60|600|600|2400	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Toluene	mg/kg	0.1	480	105	105	NE	28.8|288|288|1152	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Total BTEX	mg/kg	0.6	NE	NE	NE	NE	NE	<0.6	-	-	<0.6	-	-	-	<0.6	-	-
	Xylene (m & p)	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	-	<0.2	-	-
	Xylene (o)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	-	<0.1	-	-
	Xylene Total	mg/kg	0.3	110[2]	45	45	NE	100|1000|1000|4000	<0.3	-	-	<0.3	-	-	-	<0.3	-	-
	C6-C10 less BTEX (F1)	mg/kg	25	50[2]	180	180	700	NE	<25	-	-	<25	-	-	-	<25	-	-
Faecal Coliforms	Faecal Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	Escherichia Coli Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	Total Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats'*..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

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Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP7 0.4-0.5	TP7 0.9-1.0	TP7 4.8-4.9	TP8 0.0-0.1	TP8 0.9-1.0	TP8 2.8-2.9	TP9 0.0-0.1	TP9 1.1-1.2	TP9 2.9-3.0	TP9 3.9-4.0
								Testpit Number	TP7	TP7	TP7	TP8	TP8	TP8	TP9	TP9	TP9	TP9
								Sample Depth	0.4-0.5	0.9-1	4.8-4.9	0-0.1	0.9-1	2.8-2.9	0-0.1	1.1-1.2	2.9-3	3.9-4
								Sample Date	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014
								Lab Sample Number	SE134376.025	SE134376.026	SE134376.029	SE134396.001	SE134396.002	SE134396.004	SE134396.005	SE134396.006	SE134396.007	SE134396.008
	2346&2356-Tetrachlorophenol	mg/kg	1	NE	NE	NE	NE	NE	<1	-	-	<1	-	-	<1	-	-	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	NE	NE	NE	NE	NE	<1	-	-	-	-	-	-	-	-	-
	Exchangeable Calcium Percentage	%	0.1	NE	NE	NE	NE	NE	-	55.3	49.9	-	-	-	-	90.4	-	67.5
	Exchangeable Magnesium Percentage	%	0.1	NE	NE	NE	NE	NE	-	36.9	47.5	-	-	-	-	7.4	-	24.2
	Exchangeable Potassium Percentage	%	0.1	NE	NE	NE	NE	NE	-	2.7	1.6	-	-	-	-	2	-	7
	Exchangeable Magnesium, Mg	meq/100g	0.02	NE	NE	NE	NE	NE	-	4.3	5.4	-	-	-	-	1.8	-	2.1
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	**15[1]**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	NE	NE	NE	NE	**800|8000|8000|32000**	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	2,4,6-trichlorophenol	mg/kg	0.5	NE	NE	NE	NE	**4|40|40|160**	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	2,4-dichlorophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	2,6-dichlorophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	2-chlorophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	Pentachlorophenol	mg/kg	0.5	**130[1]**	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
Inorganics	Exchangeable Calcium	mg/kg	2	NE	NE	NE	NE	NE	-	1300	1100	-	-	-	-	4400	-	1200
	Exchangeable Magnesium	mg/kg	2	NE	NE	NE	NE	NE	-	520	660	-	-	-	-	220	-	250
	Exchangeable Potassium	mg/kg	2	NE	NE	NE	NE	NE	-	120	73	-	-	-	-	190	-	240
	Exchangeable Sodium	mg/kg	2	NE	NE	NE	NE	NE	-	140	25	-	-	-	-	16	-	27
	pH (Lab)	pH_Units	0	NE	NE	NE	NE	NE	-	7.3	6.5	-	-	-	-	6.2	-	6
	TOC	mg/kg	500	NE	NE	NE	NE	NE	-	5100	1200	-	-	-	-	14,000	-	3200
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	**0.001[3]**	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	**0.028**	<0.001	N.A.	<0.001	<0.001	<0.001
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	**0.001[3]**	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	N.A.	<0.001	<0.001	<0.001
Metals	Arsenic	mg/kg	3	**500[1]**	NE	**104**	NE	NE	4	4	<3	6	7	5	7	18	12	6
	Cadmium	mg/kg	0.3	**150[1]**	NE	NE	NE	NE	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	Chromium (III+VI)	mg/kg	0.3	**500[1]**	NE	**630**	NE	NE	24	18	20	18	18	13	19	11	11	25
	Copper	mg/kg	v	**30000[1]**	NE	**86**	NE	NE	11	7.1	11	18	21	6.9	14	21	21	16
	Iron	mg/kg	50	NE	NE	NE	NE	NE	-	7600	12,000	-	-	-	-	34,000	-	15,000
	Lead	mg/kg	1	**1200[1]**	NE	**1131**	NE	**10|100|100|400**	19	22	8	47	130	16	17	10	15	35
	Mercury	mg/kg	0.01	**120[1]**	NE	NE	NE	**0.4|4|4|16**	0.02	0.02	<0.01	0.04	0.04	<0.01	0.01	<0.01	0.02	0.01
	Nickel	mg/kg	0.5	**1200[1]**	NE	**169**	NE	**4|40|40|160**	7.1	5.9	10	13	15	8.7	15	59	24	8.8
	Zinc	mg/kg	0.5	**60000[1]**	NE	**451**	NE	NE	21	22	150	290	**470**	170	41	31	110	58
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	4,4-DDE	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	a-BHC	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Aldrin	mg/kg	0.1	**10[1]**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	b-BHC	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Chlordane (cis)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	gamma-Chlordane	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	d-BHC	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	DDD	mg/kg	0.1	**600**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	DDT	mg/kg	0.1	**600**	NE	**180**	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Dieldrin	mg/kg	0.2	**10[1]**	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Endosulfan I	mg/kg	0.2	**400**	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Endosulfan II	mg/kg	0.2	**400**	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Endosulfan sulphate	mg/kg	0.1	**400**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Endrin	mg/kg	0.2	**20[1]**	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Endrin aldehyde	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Endrin ketone	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	g-BHC (Lindane)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Heptachlor	mg/kg	0.1	**10[1]**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Heptachlor epoxide	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Methoxychlor	mg/kg	0.1	**500[1]**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	o,p-DDD	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	o,p'-DDE	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	trans-Nonachlor	mg/kg	0.1	**0.01[1]**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
Pesticides	Isodrin	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Mirex	mg/kg	0.1	**20[1]**	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-

9623 - Table 1
TP1 - TP25
Soil Analytical Results
Stage 1 ESA - Canberra Brickworks Remediation Project

Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP7 0.4-0.5	TP7 0.9-1.0	TP7 4.8-4.9	TP8 0.0-0.1	TP8 0.9-1.0	TP8 2.8-2.9	TP9 0.0-0.1	TP9 1.1-1.2	TP9 2.9-3.0	TP9 3.9-4.0
								Testpit Number	TP7	TP7	TP7	TP8	TP8	TP8	TP9	TP9	TP9	TP9
								Sample Depth	0.4-0.5	0.9-1	4.8-4.9	0-0.1	0.9-1	2.8-2.9	0-0.1	1.1-1.2	2.9-3	3.9-4
								Sample Date	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014	10/12/2014
								Lab Sample Number	SE134376.025	SE134376.026	SE134376.029	SE134396.001	SE134396.002	SE134396.004	SE134396.005	SE134396.006	SE134396.007	SE134396.008
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	1-Methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	2,4-dimethylphenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	2,4-dinitrophenol	mg/kg	2	NE	NE	NE	NE	NE	<2	-	-	<2	-	-	<2	-	-	-
	2-methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	2-methylphenol	mg/kg	0.5	NE	NE	NE	NE	400|4000|4000|16000	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	2-nitrophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	3-&4-methylphenol	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	<1	-	-	<1	-	-	-
	4-chloro-3-methylphenol	mg/kg	2	NE	NE	NE	NE	NE	<2	-	-	<2	-	-	<2	-	-	-
	4-nitrophenol	mg/kg	1	NE	NE	NE	NE	NE	<1	-	-	<1	-	-	<1	-	-	-
	Acenaphthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Acenaphthylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Benz(a)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Benzo(a) pyrene	mg/kg	0.1	4[1]	0.7	NE	NE	0.08|0.8|0.8|3.2	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Benzo(g,h,i)perylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Benzo(k)fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Chrysene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Cresol Total	mg/kg	1.5	4700[1]	NE	NE	NE	400|4000|4000|16000	<1.5	-	-	<1.5	-	-	<1.5	-	-	-
	Dibenz(a,h)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Fluorene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Naphthalene	mg/kg	0.1	5[2]	NE	170	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	4[1]	0.7	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	<0.2	-
	PAHs (Sum of total)	mg/kg	0.8	400[1]	NE	NE	NE	NE	<0.8	-	-	<0.8	-	-	<0.8	-	<0.8	-
	Phenanthrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	0.1	-
	Phenol	mg/kg	0.5	45000[1]	NE	NE	NE	28.8|288|288|1152	<0.5	-	-	<0.5	-	-	<0.5	-	-	-
	Pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	<0.1	-
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1221	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1232	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1242	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1248	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1254	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1260	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Arochlor 1268	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Aroclor 1262	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	PCBs (Sum of total)	mg/kg	1	1[1]	NE	NE	NE	NE	<1	-	-	<1	-	-	<1	-	-	-
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	NE	NE	NE	1000	NE	<25	-	-	<25	-	-	<25	-	-	-
	C16-C34	mg/kg	90	NE	1300	1300	2500	NE	<90	-	-	<90	-	-	<90	-	-	-
	C34-C40	mg/kg	120	NE	5600	5600	10,000	NE	<120	-	-	<120	-	-	<120	-	-	-
	C6 - C9	mg/kg	20	NE	NE	NE	NE	NE	<20	-	-	<20	-	-	<20	-	-	-
	C10 - C14	mg/kg	20	NE	NE	NE	NE	NE	<20	-	-	<20	-	-	<20	-	-	-
	C15 - C28	mg/kg	45	NE	NE	NE	NE	NE	<45	-	-	47	-	-	<45	-	-	-
	C29-C36	mg/kg	45	NE	NE	NE	NE	NE	<45	-	-	46	-	-	<45	-	-	-
	+C10 - C36 (Sum of total)	mg/kg	110	NE	NE	NE	NE	NE	<110	-	-	<110	-	-	<110	-	-	-
	C10 - C40 (Sum of total)	mg/kg	210	NE	NE	NE	NE	NE	<210	-	-	<210	-	-	<210	-	-	-
	C6-C10	mg/kg	25	NE	NE	NE	NE	NE	<25	-	-	<25	-	-	<25	-	-	-
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	280[2]	120	120	NE	NE	<25	-	-	<25	-	-	<25	-	-	-
	TRH C37-C40	mg/kg	100	NE	NE	NE	NE	NE	<100	-	-	<100	-	-	<100	-	-	-
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	0.7[2]	65	65	NE	1|10|10|40	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Ethylbenzene	mg/kg	0.1	NE	125	125	NE	60|600|600|2400	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Toluene	mg/kg	0.1	480	105	105	NE	28.8|288|288|1152	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Total BTEX	mg/kg	0.6	NE	NE	NE	NE	NE	<0.6	-	-	<0.6	-	-	<0.6	-	-	-
	Xylene (m & p)	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	-	<0.2	-	-	<0.2	-	-	-
	Xylene (o)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	-	<0.1	-	-	<0.1	-	-	-
	Xylene Total	mg/kg	0.3	110[2]	45	45	NE	100|1000|1000|4000	<0.3	-	-	<0.3	-	-	<0.3	-	-	-
	C6-C10 less BTEX (F1)	mg/kg	25	50[2]	180	180	700	NE	<25	-	-	<25	-	-	<25	-	-	-
Faecal Coliforms	Faecal Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	<200	-	-	-	-
	Escherichia Coli Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	<200	-	-	-	-
	Total Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	200	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats*'..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP10 0.4-0.5	TP10 1.9-2.0	TP10 3.9-4.0	TP11 0.0-0.1	TP11 0.4-0.5	TP12 0.0-0.1	TP12 0.4-0.5	TP13 0.0-0.1	TP13 0.9-1.0
								Testpit Number	TP10	TP10	TP10	TP11	TP11	TP12	TP12	TP13	TP13
								Sample Depth	0.4-0.5	1.9-2	3.9-4	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1	0.9-1
								Sample Date	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	10/12/2014	10/12/2014	11/12/2014	11/12/2014
								Lab Sample Number	SE134396.009	SE134396.010	SE134396.011	SE134396.012	SE134396.013	SE134396.014	SE134396.015	SE134396.016	SE134396A.039
	2346&2356-Tetrachlorophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	-	<1	-	<1	-	<1	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-
	Exchangeable Calcium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	51.8	-	-	-	-
	Exchangeable Magnesium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	38.1	-	-	-	-
	Exchangeable Potassium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	7	-	-	-	-
	Exchangeable Magnesium, Mg	meq/100g	0.02	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	2.1	-	-	-	-
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	**15[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**800|8000|8000|32000**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	2,4,6-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**4|40|40|160**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	2,4-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	2,6-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	2-chlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	Pentachlorophenol	mg/kg	0.5	**130[1]**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
Inorganics	Exchangeable Calcium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	580	-	-	-	-
	Exchangeable Magnesium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	260	-	-	-	-
	Exchangeable Potassium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	150	-	-	-	-
	Exchangeable Sodium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	41	-	-	-	-
	pH (Lab)	pH_Units	0	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	5.5	-	-	-	-
	TOC	mg/kg	500	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	4700	-	-	-	-
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**5.7**	**0.046**
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	**0.37**	**0.053**
Metals	Arsenic	mg/kg	3	**500[1]**	**NE**	**104**	**NE**	**NE**	11	14	11	6	6	7	6	9	-
	Cadmium	mg/kg	0.3	**150[1]**	**NE**	**NE**	**NE**	**NE**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	2.3	-
	Chromium (III+VI)	mg/kg	0.3	**500[1]**	**NE**	**630**	**NE**	**NE**	12	14	14	16	32	22	15	39	-
	Copper	mg/kg	v	**30000[1]**	**NE**	**86**	**NE**	**NE**	29	18	38	9.9	12	47	46	35	-
	Iron	mg/kg	50	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	21,000	-	-	-	-
	Lead	mg/kg	1	**1200[1]**	**NE**	**1131**	**NE**	**10|100|100|400**	23	15	22	38	38	480	500	140	-
	Mercury	mg/kg	0.01	**120[1]**	**NE**	**NE**	**NE**	**0.4|4|4|16**	<0.01	<0.01	0.01	0.03	0.02	<0.01	<0.01	0.06	-
	Nickel	mg/kg	0.5	**1200[1]**	**NE**	**169**	**NE**	**4|40|40|160**	30	46	25	8.8	10	8.2	10	23	-
	Zinc	mg/kg	0.5	**60000[1]**	**NE**	**451**	**NE**	**NE**	84	45	91	160	30	160	150	440	-
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	4,4-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	a-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Aldrin	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	b-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Chlordane (cis)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	gamma-Chlordane	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	d-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	DDD	mg/kg	0.1	**600**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	DDT	mg/kg	0.1	**600**	**NE**	**180**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Dieldrin	mg/kg	0.2	**10[1]**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	1	-
	Endosulfan I	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Endosulfan II	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Endosulfan sulphate	mg/kg	0.1	**400**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Endrin	mg/kg	0.2	**20[1]**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Endrin aldehyde	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Endrin ketone	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	g-BHC (Lindane)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Heptachlor	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Heptachlor epoxide	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Methoxychlor	mg/kg	0.1	**500[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	o,p-DDD	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	o,p'-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	trans-Nonachlor	mg/kg	0.1	**0.01[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
Pesticides	Isodrin	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Mirex	mg/kg	0.1	**20[1]**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-

9623 - Table 1
TP1 - TP25
Soil Analytical Results
Stage 1 ESA - Canberra Brickworks Remediation Project

								Field ID	TP10 0.4-0.5	TP10 1.9-2.0	TP10 3.9-4.0	TP11 0.0-0.1	TP11 0.4-0.5	TP12 0.0-0.1	TP12 0.4-0.5	TP13 0.0-0.1	TP13 0.9-1.0
								Testpit Number	TP10	TP10	TP10	TP11	TP11	TP12	TP12	TP13	TP13
								Sample Depth	0.4-0.5	1.9-2	3.9-4	0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1	0.9-1
								Sample Date	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	10/12/2014	10/12/2014	11/12/2014	11/12/2014
								Lab Sample Number	SE134396.009	SE134396.010	SE134396.011	SE134396.012	SE134396.013	SE134396.014	SE134396.015	SE134396.016	SE134396A.039
Chem_Group	**ChemName**	**output unit**	**EQL**	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)									
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	18	<0.1
	1-Methylnaphthalene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	<0.1	<0.1
	2,4-dimethylphenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	2,4-dinitrophenol	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	<2	-	-	<2	-	<2	-	<2	-
	2-methylnaphthalene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	<0.1	<0.1
	2-methylphenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**400|4000|4000|16000**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	2-nitrophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	3-&4-methylphenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	-	<1	-	<1	-	<1	-
	4-chloro-3-methylphenol	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	<2	-	-	<2	-	<2	-	<2	-
	4-nitrophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	-	<1	-	<1	-	<1	-
	Acenaphthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	0.9	<0.1
	Acenaphthylene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	0.2	<0.1
	Anthracene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	4.1	<0.1
	Benz(a)anthracene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	14	<0.1
	Benzo(a) pyrene	mg/kg	0.1	**4[1]**	**0.7**	**NE**	**NE**	**0.08|0.8|0.8|3.2**	<0.1	-	-	<0.1	<0.1	<0.1	-	**9.5**	<0.1
	Benzo(g,h,i)perylene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	5.9	<0.1
	Benzo(k)fluoranthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	5.1	<0.1
	Chrysene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	8.7	<0.1
	Cresol Total	mg/kg	1.5	**4700[1]**	**NE**	**NE**	**NE**	**400|4000|4000|16000**	<1.5	-	-	<1.5	-	<1.5	-	<1.5	-
	Dibenz(a,h)anthracene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	0.8	<0.1
	Fluoranthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	41	<0.1
	Fluorene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	1.6	<0.1
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	7.3	<0.1
	Naphthalene	mg/kg	0.1	**5[2]**	**NE**	**170**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	**4[1]**	**0.7**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	**15**	-
	PAHs (Sum of total)	mg/kg	0.8	**400[1]**	**NE**	**NE**	**NE**	**NE**	<0.8	-	-	<0.8	<0.8	<0.8	-	170	<0.8
	Phenanthrene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	0.2	-	-	<0.1	<0.1	<0.1	-	28	<0.1
	Phenol	mg/kg	0.5	**45000[1]**	**NE**	**NE**	**NE**	**28.8|288|288|1152**	<0.5	-	-	<0.5	-	<0.5	-	<0.5	-
	Pyrene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	<0.1	<0.1	-	29	<0.1
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1221	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1232	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1242	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1248	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1254	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1260	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Arochlor 1268	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Aroclor 1262	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	PCBs (Sum of total)	mg/kg	1	**1[1]**	**NE**	**NE**	**NE**	**NE**	<1	-	-	<1	-	<1	-	<1	-
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	**NE**	**NE**	**NE**	**1000**	**NE**	<25	-	-	<25	<25	<25	-	<25	<25
	C16-C34	mg/kg	90	**NE**	**1300**	**1300**	**2500**	**NE**	<90	-	-	200	<90	<90	-	630	<90
	C34-C40	mg/kg	120	**NE**	**5600**	**5600**	**10,000**	**NE**	<120	-	-	<120	<120	<120	-	<120	<120
	C6 - C9	mg/kg	20	**NE**	**NE**	**NE**	**NE**	**NE**	<20	-	-	<20	<20	<20	-	<20	<20
	C10 - C14	mg/kg	20	**NE**	**NE**	**NE**	**NE**	**NE**	<20	-	-	<20	<20	<20	-	<20	<20
	C15 - C28	mg/kg	45	**NE**	**NE**	**NE**	**NE**	**NE**	<45	-	-	99	<45	<45	-	420	67
	C29-C36	mg/kg	45	**NE**	**NE**	**NE**	**NE**	**NE**	<45	-	-	150	<45	<45	-	270	<45
	+C10 - C36 (Sum of total)	mg/kg	110	**NE**	**NE**	**NE**	**NE**	**NE**	<110	-	-	250	<110	<110	-	690	<110
	C10 - C40 (Sum of total)	mg/kg	210	**NE**	**NE**	**NE**	**NE**	**NE**	<210	-	-	250	<210	<210	-	690	<210
	C6-C10	mg/kg	25	**NE**	**NE**	**NE**	**NE**	**NE**	<25	-	-	<25	<25	<25	-	<25	<25
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	**280[2]**	**120**	**120**	**NE**	**NE**	<25	-	-	<25	-	<25	-	<25	-
	TRH C37-C40	mg/kg	100	**NE**	**NE**	**NE**	**NE**	**NE**	<100	-	-	<100	<100	<100	-	<100	<100
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	**0.7[2]**	**65**	**65**	**NE**	**1|10|10|40**	<0.1	-	-	<0.1	<0.1	<0.1	-	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	**NE**	**125**	**125**	**NE**	**60|600|600|2400**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Toluene	mg/kg	0.1	**480**	**105**	**105**	**NE**	**28.8|288|288|1152**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Total BTEX	mg/kg	0.6	**NE**	**NE**	**NE**	**NE**	**NE**	<0.6	-	-	<0.6	-	<0.6	-	<0.6	-
	Xylene (m & p)	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	-	<0.2	-	<0.2	-	<0.2	-
	Xylene (o)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	-	<0.1	-	<0.1	-	<0.1	-
	Xylene Total	mg/kg	0.3	**110[2]**	**45**	**45**	**NE**	**100|1000|1000|4000**	<0.3	-	-	<0.3	-	<0.3	-	<0.3	-
	C6-C10 less BTEX (F1)	mg/kg	25	**50[3]**	**180**	**180**	**700**	**NE**	<25	-	-	<25	<25	<25	-	<25	<25
Faecal Coliforms	Faecal Coliform Count	Counts	200	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-
	Escherichia Coli Count	Counts	200	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-
	Total Coliform Count	Counts	200	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats'*..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

								Field ID	TP13 1.9-2.0	TP13 2.9-3.0	TP13 3.5-3.6	TP14 0.0-0.1	TP 14 0.9-1.0	TP14 2.9-3.0	TP14 5.4-5.5	TP15 0.0-0.1	TP15 0.9-1.0
								Testpit Number	TP13	TP13	TP13	TP14	TP14	TP14	TP14	TP15	TP15
								Sample Depth	1.9-2	2.9-3	3.5-3.6	0-0.1	0.9-1	2.9-3	5.4-5.5	0-0.1	0.9-1
								Sample Date	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	10/12/2014	10/12/2014
								Lab Sample Number	SE134396.017	SE134396.018	SE134396.019	SE134396.020	SE134396.021	SE134396.021	SE134396.022	SE134396.023	SE134396.024
Chem_Group	**ChemName**	**output unit**	**EQL**	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)									
	2346&2356-Tetrachlorophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<1	-	-	-	<1	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-
	Exchangeable Calcium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	91.2	-	53.7	-	-	-	-	-	32.4
	Exchangeable Magnesium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	6.9	-	40.6	-	-	-	-	-	57.6
	Exchangeable Potassium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	1.6	-	3.9	-	-	-	-	-	5.1
	Exchangeable Magnesium, Mg	meq/100g	0.02	**NE**	**NE**	**NE**	**NE**	**NE**	1	-	2.8	-	-	-	-	-	3.9
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	**15[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**800|8000|8000|32000**	-	-	-	<0.5	-	-	-	<0.5	-
	2,4,6-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**4|40|40|160**	-	-	-	<0.5	-	-	-	<0.5	-
	2,4-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.5	-	-	-	<0.5	-
	2,6-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.5	-	-	-	<0.5	-
	2-chlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.5	-	-	-	<0.5	-
	Pentachlorophenol	mg/kg	0.5	**130[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.5	-	-	-	<0.5	-
Inorganics	Exchangeable Calcium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	2700	-	740	-	-	-	-	-	430
	Exchangeable Magnesium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	130	-	340	-	-	-	-	-	470
	Exchangeable Potassium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	95	-	100	-	-	-	-	-	130
	Exchangeable Sodium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	8	-	28	-	-	-	-	-	75
	pH (Lab)	pH_Units	0	**NE**	**NE**	**NE**	**NE**	**NE**	5.2	-	4.8	-	-	-	-	-	6.2
	TOC	mg/kg	500	**NE**	**NE**	**NE**	**NE**	**NE**	2000	-	4300	-	-	-	-	-	1100
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	**0.001[3]**	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Metals	Arsenic	mg/kg	3	**500[1]**	**NE**	**104**	**NE**	**NE**	13	-	4	5	6	10	11	6	15
	Cadmium	mg/kg	0.3	**150[1]**	**NE**	**NE**	**NE**	**NE**	0.5	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	Chromium (III+VI)	mg/kg	0.3	**500[1]**	**NE**	**630**	**NE**	**NE**	28	-	28	36	24	13	9.7	24	20
	Copper	mg/kg	v	**30000[1]**	**NE**	**86**	**NE**	**NE**	45	-	15	16	12	16	28	11	16
	Iron	mg/kg	50	**NE**	**NE**	**NE**	**NE**	**NE**	36,000	-	28,000	-	-	-	-	-	28,000
	Lead	mg/kg	1	**1200[1]**	**NE**	**1131**	**NE**	**10|100|100|400**	110	-	32	20	31	20	67	35	110
	Mercury	mg/kg	0.01	**120[1]**	**NE**	**NE**	**NE**	**0.4|4|4|16**	0.04	-	<0.01	<0.01	0.04	0.02	<0.01	0.01	<0.01
	Nickel	mg/kg	0.5	**1200[1]**	**NE**	**169**	**NE**	**4|40|40|160**	23	-	11	13	8.9	26	30	8.2	7.2
	Zinc	mg/kg	0.5	**60000[1]**	**NE**	**451**	**NE**	**NE**	450	-	240	43	38	55	90	47	70
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	4,4-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	a-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Aldrin	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	b-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Chlordane (cis)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	gamma-Chlordane	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	d-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	DDD	mg/kg	0.1	**600**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	DDT	mg/kg	0.1	**600**	**NE**	**180**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Dieldrin	mg/kg	0.2	**10[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.2	-	-	-	<0.2	-
	Endosulfan I	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.2	-	-	-	<0.2	-
	Endosulfan II	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.2	-	-	-	<0.2	-
	Endosulfan sulphate	mg/kg	0.1	**400**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Endrin	mg/kg	0.2	**20[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.2	-	-	-	<0.2	-
	Endrin aldehyde	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Endrin ketone	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	g-BHC (Lindane)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Heptachlor	mg/kg	0.1	**10[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Heptachlor epoxide	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Methoxychlor	mg/kg	0.1	**500[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	o,p-DDD	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	o,p'-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	trans-Nonachlor	mg/kg	0.1	**0.01[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
Pesticides	Isodrin	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-
	Mirex	mg/kg	0.1	**20[1]**	**NE**	**NE**	**NE**	**NE**	-	-	-	<0.1	-	-	-	<0.1	-

								Field ID	TP13 1.9-2.0	TP13 2.9-3.0	TP13 3.5-3.6	TP14 0.0-0.1	TP 14 0.9-1.0	TP14 2.9-3.0	TP14 5.4-5.5	TP15 0.0-0.1	TP15 0.9-1.0
								Testpit Number	TP13	TP13	TP13	TP14	TP14	TP14	TP14	TP15	TP15
								Sample Depth	1.9-2	2.9-3	3.5-3.6	0-0.1	0.9-1	2.9-3	5.4-5.5	0-0.1	0.9-1
								Sample Date	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	10/12/2014	10/12/2014
								Lab Sample Number	SE134396.017	SE134396.018	SE134396.019	SE134396.020	SE134396.021	SE134396.021	SE134396.022	SE134396.023	SE134396.024
Chem_Group	**ChemName**	**output unit**	**EQL**	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)									
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	1-Methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	2,4-dimethylphenol	mg/kg	0.5	NE	NE	NE	NE	NE	-	-	-	<0.5	-	-	-	<0.5	-
	2,4-dinitrophenol	mg/kg	2	NE	NE	NE	NE	NE	-	-	-	<2	-	-	-	<2	-
	2-methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	2-methylphenol	mg/kg	0.5	NE	NE	NE	NE	**400|4000|4000|16000**	-	-	-	<0.5	-	-	-	1	-
	2-nitrophenol	mg/kg	0.5	NE	NE	NE	NE	NE	-	-	-	<0.5	-	-	-	<0.5	-
	3-&4-methylphenol	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	<1	-	-	-	<1	-
	4-chloro-3-methylphenol	mg/kg	2	NE	NE	NE	NE	NE	-	-	-	<2	-	-	-	<2	-
	4-nitrophenol	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	<1	-	-	-	<1	-
	Acenaphthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Acenaphthylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Benz(a)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Benzo(a) pyrene	mg/kg	0.1	4[1]	0.7	NE	NE	**0.08|0.8|0.8|3.2**	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Benzo(g,h,i)perylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Benzo(k)fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Chrysene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Cresol Total	mg/kg	1.5	4700[1]	NE	NE	NE	**400|4000|4000|16000**	-	-	-	<1.5	-	-	-	<1.5	-
	Dibenz(a,h)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Fluorene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Naphthalene	mg/kg	0.1	5[2]	NE	170	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	4[1]	0.7	NE	NE	NE	-	-	-	<0.2	<0.2	<0.2	-	<0.2	-
	PAHs (Sum of total)	mg/kg	0.8	400[1]	NE	NE	NE	NE	<0.8	<0.8	-	<0.8	<0.8	<0.8	-	<0.8	-
	Phenanthrene	mg/kg	0.1	NE	NE	NE	NE	NE	0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
	Phenol	mg/kg	0.5	45000[1]	NE	NE	NE	**28.8|288|288|1152**	-	-	-	<0.5	-	-	-	<0.5	-
	Pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	<0.1	-
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1221	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1232	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1242	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1248	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1254	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1260	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Arochlor 1268	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Aroclor 1262	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	PCBs (Sum of total)	mg/kg	1	1[1]	NE	NE	NE	NE	-	-	-	<1	-	-	-	<1	-
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	NE	NE	NE	1000	NE	<25	<25	-	<25	-	-	-	<25	-
	C16-C34	mg/kg	90	NE	1300	1300	2500	NE	460	230	-	<90	-	-	-	<90	-
	C34-C40	mg/kg	120	NE	5600	5600	10,000	NE	<120	<120	-	<120	-	-	-	<120	-
	C6 - C9	mg/kg	20	NE	NE	NE	NE	NE	<20	<20	-	<20	-	-	-	<20	-
	C10 - C14	mg/kg	20	NE	NE	NE	NE	NE	<20	<20	-	<20	-	-	-	<20	-
	C15 - C28	mg/kg	45	NE	NE	NE	NE	NE	310	150	-	<45	-	-	-	<45	-
	C29-C36	mg/kg	45	NE	NE	NE	NE	NE	200	85	-	<45	-	-	-	<45	-
	+C10 - C36 (Sum of total)	mg/kg	110	NE	NE	NE	NE	NE	510	240	-	<110	-	-	-	<110	-
	C10 - C40 (Sum of total)	mg/kg	210	NE	NE	NE	NE	NE	510	240	-	<210	-	-	-	<210	-
	C6-C10	mg/kg	25	NE	NE	NE	NE	NE	<25	<25	-	<25	-	-	-	<25	-
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	280[2]	120	120	NE	NE	-	-	-	<25	-	-	-	<25	-
	TRH C37-C40	mg/kg	100	NE	NE	NE	NE	NE	<100	<100	-	<100	-	-	-	<100	-
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	0.7[2]	65	65	NE	**1|10|10|40**	<0.1	<0.1	-	<0.1	-	-	-	<0.1	-
	Ethylbenzene	mg/kg	0.1	NE	125	125	NE	**60|600|600|2400**	-	-	-	<0.1	-	-	-	<0.1	-
	Toluene	mg/kg	0.1	480	105	105	NE	**28.8|288|288|1152**	-	-	-	<0.1	-	-	-	<0.1	-
	Total BTEX	mg/kg	0.6	NE	NE	NE	NE	NE	-	-	-	<0.6	-	-	-	<0.6	-
	Xylene (m & p)	mg/kg	0.2	NE	NE	NE	NE	NE	-	-	-	<0.2	-	-	-	<0.2	-
	Xylene (o)	mg/kg	0.1	NE	NE	NE	NE	NE	-	-	-	<0.1	-	-	-	<0.1	-
	Xylene Total	mg/kg	0.3	110[2]	45	45	NE	**100|1000|1000|4000**	-	-	-	<0.3	-	-	-	<0.3	-
	C6-C10 less BTEX (F1)	mg/kg	25	50[2]	180	180	700	NE	<25	<25	-	<25	-	-	-	<25	-
Faecal Coliforms	Faecal Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-
	Escherichia Coli Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-
	Total Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats*'..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

Chem_Group	ChemName	output unit	EQL	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)	Field ID	TP16 0.0-0.1	TP16 0.6-0.7	TP17 0.0-0.1	TP17 0.9-1.0	TP17 2.9-3.0	TP18 0.0-0.1	TP18 0.6-0.7	TP19 0.0-0.1	TP19 0.6-0.7
								Testpit Number	TP16	TP16	TP17	TP17	TP17	TP18	TP18	TP19	TP19
								Sample Depth	0-0.1	0.6-0.7	0-0.1	0.9-1	2.9-3	0-0.1	0.6-0.7	0-0.1	0.6-0.7
								Sample Date	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014
								Lab Sample Number	SE134396.025	SE134396.026	SE134396.027	SE134396.028	SE134396.029	SE134396.030	SE134396.031	SE134396.032	SE134396.033
	2346&2356-Tetrachlorophenol	mg/kg	1	NE	NE	NE	NE	NE	<1	-	<1	-	-	<1	-	<1	-
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-
	Exchangeable Calcium Percentage	%	0.1	NE	NE	NE	NE	NE	-	-	76.8	-	45.4	-	-	-	-
	Exchangeable Magnesium Percentage	%	0.1	NE	NE	NE	NE	NE	-	-	16.8	-	48.7	-	-	-	-
	Exchangeable Potassium Percentage	%	0.1	NE	NE	NE	NE	NE	-	-	6.2	-	3.5	-	-	-	-
	Exchangeable Magnesium, Mg	meq/100g	0.02	NE	NE	NE	NE	NE	-	-	5.3	-	6.7	-	-	-	-
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	15[1]	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	NE	NE	NE	NE	800|8000|8000|32000	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	2,4,6-trichlorophenol	mg/kg	0.5	NE	NE	NE	NE	4|40|40|160	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	2,4-dichlorophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	2,6-dichlorophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	2-chlorophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	Pentachlorophenol	mg/kg	0.5	130[1]	NE	NE	NE	NE	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
Inorganics	Exchangeable Calcium	mg/kg	2	NE	NE	NE	NE	NE	-	-	4900	-	1300	-	-	-	-
	Exchangeable Magnesium	mg/kg	2	NE	NE	NE	NE	NE	-	-	650	-	820	-	-	-	-
	Exchangeable Potassium	mg/kg	2	NE	NE	NE	NE	NE	-	-	770	-	190	-	-	-	-
	Exchangeable Sodium	mg/kg	2	NE	NE	NE	NE	NE	-	-	15	-	75	-	-	-	-
	pH (Lab)	pH_Units	0	NE	NE	NE	NE	NE	-	-	7.2	-	6.7	-	-	-	-
	TOC	mg/kg	500	NE	NE	NE	NE	NE	-	-	44,000	-	1800	-	-	-	-
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	0.001[3]	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	0.001[3]	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Metals	Arsenic	mg/kg	3	500[1]	NE	104	NE	NE	5	5	8	5	<3	4	5	4	5
	Cadmium	mg/kg	0.3	150[1]	NE	NE	NE	NE	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	Chromium (III+VI)	mg/kg	0.3	500[1]	NE	630	NE	NE	23	20	17	18	19	24	23	29	24
	Copper	mg/kg	v	30000[1]	NE	86	NE	NE	10	9.2	16	15	9.7	8.6	13	6.4	15
	Iron	mg/kg	50	NE	NE	NE	NE	NE	-	-	20,000	-	28,000	-	-	-	-
	Lead	mg/kg	1	1200[1]	NE	1131	NE	10|100|100|400	41	41	29	27	11	33	43	24	16
	Mercury	mg/kg	0.01	120[1]	NE	NE	NE	0.4|4|4|16	<0.01	<0.01	0.06	0.02	0.01	0.02	<0.01	0.01	0.05
	Nickel	mg/kg	0.5	1200[1]	NE	169	NE	4|40|40|160	7.6	5.8	13	9.9	12	7.8	9.4	6.8	9.2
	Zinc	mg/kg	0.5	60000[1]	NE	451	NE	NE	68	36	70	42	97	73	36	40	29
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	4,4-DDE	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	a-BHC	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Aldrin	mg/kg	0.1	10[1]	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	b-BHC	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Chlordane (cis)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	gamma-Chlordane	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	d-BHC	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	DDD	mg/kg	0.1	600	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	DDT	mg/kg	0.1	600	NE	180	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Dieldrin	mg/kg	0.2	10[1]	NE	NE	NE	NE	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Endosulfan I	mg/kg	0.2	400	NE	NE	NE	NE	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Endosulfan II	mg/kg	0.2	400	NE	NE	NE	NE	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Endosulfan sulphate	mg/kg	0.1	400	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Endrin	mg/kg	0.2	20[1]	NE	NE	NE	NE	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Endrin aldehyde	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Endrin ketone	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	g-BHC (Lindane)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Heptachlor	mg/kg	0.1	10[1]	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Heptachlor epoxide	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Methoxychlor	mg/kg	0.1	500[1]	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	o,p-DDD	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	o,p'-DDE	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	trans-Nonachlor	mg/kg	0.1	0.01[1]	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
Pesticides	Isodrin	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Mirex	mg/kg	0.1	20[1]	NE	NE	NE	NE	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-

								Field ID	TP16 0.0-0.1	TP16 0.6-0.7	TP17 0.0-0.1	TP17 0.9-1.0	TP17 2.9-3.0	TP18 0.0-0.1	TP18 0.6-0.7	TP19 0.0-0.1	TP19 0.6-0.7
								Testpit Number	TP16	TP16	TP17	TP17	TP17	TP18	TP18	TP19	TP19
								Sample Depth	0-0.1	0.6-0.7	0-0.1	0.9-1	2.9-3	0-0.1	0.6-0.7	0-0.1	0.6-0.7
								Sample Date	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014	11/12/2014
								Lab Sample Number	SE134396.025	SE134396.026	SE134396.027	SE134396.028	SE134396.029	SE134396.030	SE134396.031	SE134396.032	SE134396.033
Chem_Group	**ChemName**	**output unit**	**EQL**	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)									
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	0.1	-	-	<0.1	-	<0.1	-
	1-Methylnaphthalene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	2,4-dimethylphenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	2,4-dinitrophenol	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	<2	-	<2	-	-	<2	-	<2	-
	2-methylnaphthalene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	2-methylphenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**400|4000|4000|16000**	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	2-nitrophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	3-&4-methylphenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	<1	-	-	<1	-	<1	-
	4-chloro-3-methylphenol	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	<2	-	<2	-	-	<2	-	<2	-
	4-nitrophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	<1	-	-	<1	-	<1	-
	Acenaphthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Acenaphthylene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Anthracene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Benz(a)anthracene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Benzo(a) pyrene	mg/kg	0.1	**4[1]**	**0.7**	**NE**	**NE**	**0.08|0.8|0.8|3.2**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Benzo(g,h,i)perylene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Benzo(k)fluoranthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Chrysene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	0.1	-	-	<0.1	-	<0.1	-
	Cresol Total	mg/kg	1.5	**4700[1]**	**NE**	**NE**	**NE**	**400|4000|4000|16000**	<1.5	-	<1.5	-	-	<1.5	-	<1.5	-
	Dibenz(a,h)anthracene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Fluoranthene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	0.2	-	-	<0.1	-	<0.1	-
	Fluorene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Naphthalene	mg/kg	0.1	**5[2]**	**NE**	**170**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	**4[1]**	**0.7**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	
	PAHs (Sum of total)	mg/kg	0.8	**400[1]**	**NE**	**NE**	**NE**	**NE**	<0.8	-	<0.8	-	-	<0.8	-	<0.8	-
	Phenanthrene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	0.2	-	-	<0.1	-	<0.1	-
	Phenol	mg/kg	0.5	**45000[1]**	**NE**	**NE**	**NE**	**28.8|288|288|1152**	<0.5	-	<0.5	-	-	<0.5	-	<0.5	-
	Pyrene	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	0.2	-	-	<0.1	-	<0.1	-
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1221	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1232	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1242	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1248	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1254	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1260	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Arochlor 1268	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Aroclor 1262	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	PCBs (Sum of total)	mg/kg	1	**1[1]**	**NE**	**NE**	**NE**	**NE**	<1	-	<1	-	-	<1	-	<1	-
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	**NE**	**NE**	**NE**	**1000**	**NE**	<25	-	<25	-	-	<25	-	<25	-
	C16-C34	mg/kg	90	**NE**	**1300**	**1300**	**2500**	**NE**	<90	-	<90	-	-	<90	-	<90	-
	C34-C40	mg/kg	120	**NE**	**5600**	**5600**	**10,000**	**NE**	<120	-	<120	-	-	<120	-	<120	-
	C6 - C9	mg/kg	20	**NE**	**NE**	**NE**	**NE**	**NE**	<20	-	<20	-	-	<20	-	<20	-
	C10 - C14	mg/kg	20	**NE**	**NE**	**NE**	**NE**	**NE**	<20	-	<20	-	-	<20	-	<20	-
	C15 - C28	mg/kg	45	**NE**	**NE**	**NE**	**NE**	**NE**	<45	-	<45	-	-	<45	-	<45	-
	C29-C36	mg/kg	45	**NE**	**NE**	**NE**	**NE**	**NE**	<45	-	100	-	-	<45	-	<45	-
	+C10 - C36 (Sum of total)	mg/kg	110	**NE**	**NE**	**NE**	**NE**	**NE**	<110	-	<110	-	-	<110	-	<110	-
	C10 - C40 (Sum of total)	mg/kg	210	**NE**	**NE**	**NE**	**NE**	**NE**	<210	-	<210	-	-	<210	-	<210	-
	C6-C10	mg/kg	25	**NE**	**NE**	**NE**	**NE**	**NE**	<25	-	<25	-	-	<25	-	<25	-
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	**280[2]**	**120**	**120**	**NE**	**NE**	<25	-	<25	-	-	<25	-	<25	-
	TRH C37-C40	mg/kg	100	**NE**	**NE**	**NE**	**NE**	**NE**	<100	-	<100	-	-	<100	-	<100	-
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	**0.7[2]**	**65**	**65**	**NE**	**1|10|10|40**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Ethylbenzene	mg/kg	0.1	**NE**	**125**	**125**	**NE**	**60|600|600|2400**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Toluene	mg/kg	0.1	**480**	**105**	**105**	**NE**	**28.8|288|288|1152**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Total BTEX	mg/kg	0.6	**NE**	**NE**	**NE**	**NE**	**NE**	<0.6	-	<0.6	-	-	<0.6	-	<0.6	-
	Xylene (m & p)	mg/kg	0.2	**NE**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	-	<0.2	-	<0.2	-
	Xylene (o)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-
	Xylene Total	mg/kg	0.3	**110[2]**	**45**	**45**	**NE**	**100|1000|1000|4000**	<0.3	-	<0.3	-	-	<0.3	-	<0.3	-
	C6-C10 less BTEX (F1)	mg/kg	25	**50[2]**	**180**	**180**	**700**	**NE**	<25	-	<25	-	-	<25	-	<25	-
Faecal Coliforms	Faecal Coliform Count	Counts	200	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-
	Escherichia Coli Count	Counts	200	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-
	Total Coliform Count	Counts	200	**NE**	**NE**	**NE**	**NE**	**NE**	-	-	-	-	-	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats'*..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

								Field ID	TP20 0.0-0.1	TP20 0.5-0.6	TP21 0.0-0.11	TP21 0.5-0.6	TP22 0.0-0.1	TP22 0.4-0.5	TP23 0.0-0.1	TP23 0.9-1.0	TP24 0.0-0.1	TP25 0.0-0.1
								Testpit Number	TP20	TP20	TP21	TP21	TP22	TP22	TP23	TP23	TP24	TP25
								Sample Depth	0-0.1	0.5-0.6	0-0.11	0.5-0.6	0-0.1	0.4-0.5	0-0.1	0.9-1	0-0.1	0-0.1
								Sample Date	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014
								Lab Sample Number	SE134169.001	SE134169.002	SE134169.003	SE134169.004	SE134169.005	SE134169.006	SE134169.007	SE134169.008	SE134169.009	SE134169.010
Chem_Group	**ChemName**	**output unit**	**EQL**	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)											
	2346&2356-Tetrachlorophenol	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	<1	-	<1	-	<1	-	<1	<1
	3/4-Methylphenol (m/p-cresol)	mg/kg	1	**NE**	**NE**	**NE**	**NE**	**NE**	<1	-	<1	-	<1	-	<1	-	<1	<1
	Exchangeable Calcium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	52.7	-	-	-	87.4	-	64.7	-	-
	Exchangeable Magnesium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	39.2	-	-	-	10.8	-	32.7	-	-
	Exchangeable Potassium Percentage	%	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	-	6.6	-	-	-	1.5	-	2.1	-	-
	Exchangeable Magnesium, Mg	meq/100g	0.02	**NE**	**NE**	**NE**	**NE**	**NE**	-	2.5	-	-	-	2.1	-	4.5	-	-
Halogenated Benzenes	Hexachlorobenzene	mg/kg	0.1	**15**[1]	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**800|8000|8000|32000**	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	2,4,6-trichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**4|40|40|160**	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	2,4-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	2,6-dichlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	2-chlorophenol	mg/kg	0.5	**NE**	**NE**	**NE**	**NE**	**NE**	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	Pentachlorophenol	mg/kg	0.5	**130**[1]	**NE**	**NE**	**NE**	**NE**	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
Inorganics	Exchangeable Calcium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	680	-	-	-	3500	-	1800	-	-
	Exchangeable Magnesium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	310	-	-	-	260	-	550	-	-
	Exchangeable Potassium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	170	-	-	-	120	-	110	-	-
	Exchangeable Sodium	mg/kg	2	**NE**	**NE**	**NE**	**NE**	**NE**	-	23	-	-	-	15	-	15	-	-
	pH (Lab)	pH_Units	0	**NE**	**NE**	**NE**	**NE**	**NE**	-	7	-	-	-	8.4	-	7.7	-	-
	TOC	mg/kg	500	**NE**	**NE**	**NE**	**NE**	**NE**	-	5600	-	-	-	9100	-	13,000	-	-
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	%w/w	0.001	**0.001**[3]	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos AF/FA	Asbestos in soil (<2mm AF/FA)	%w/w	0.001	**0.001**[3]	**NE**	**NE**	**NE**	**NE**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Metals	Arsenic	mg/kg	3	**500**[1]	**NE**	**104**	**NE**	**NE**	3	3	<3	4	5	8	6	7	6	6
	Cadmium	mg/kg	0.3	**150**[1]	**NE**	**NE**	**NE**	**NE**	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
	Chromium (III+VI)	mg/kg	0.3	**500**[1]	**NE**	**630**	**NE**	**NE**	30	33	26	30	22	18	20	16	37	32
	Copper	mg/kg	v	**30000**[3]	**NE**	**86**	**NE**	**NE**	6.8	13	7.1	15	14	19	17	20	8.8	7.1
	Iron	mg/kg	50	**NE**	**NE**	**NE**	**NE**	**NE**	-	24,000	-	-	-	22,000	-	24,000	-	-
	Lead	mg/kg	1	**1200**[1]	**NE**	**1131**	**NE**	**10|100|100|400**	22	17	19	67	34	25	27	25	34	29
	Mercury	mg/kg	0.01	**120**[1]	**NE**	**NE**	**NE**	**0.4|4|4|16**	0.03	0.03	0.04	0.02	0.02	0.03	0.02	0.03	0.03	0.04
	Nickel	mg/kg	0.5	**1200**[1]	**NE**	**169**	**NE**	**4|40|40|160**	7.7	8.6	6.4	12	10	17	11	18	6.4	7
	Zinc	mg/kg	0.5	**60000**[3]	**NE**	**451**	**NE**	**NE**	27	28	28	25	45	63	49	77	50	33
Organochlorine Pesticides (OCPs)	2,4-DDT	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	4,4-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	a-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Aldrin	mg/kg	0.1	**10**[1]	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	b-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Chlordane (cis)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	gamma-Chlordane	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	d-BHC	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	DDD	mg/kg	0.1	**600**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	DDT	mg/kg	0.1	**600**	**NE**	**180**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Dieldrin	mg/kg	0.2	**10**[1]	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Endosulfan I	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Endosulfan II	mg/kg	0.2	**400**	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Endosulfan sulphate	mg/kg	0.1	**400**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Endrin	mg/kg	0.2	**20**[1]	**NE**	**NE**	**NE**	**NE**	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Endrin aldehyde	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Endrin ketone	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	g-BHC (Lindane)	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Heptachlor	mg/kg	0.1	**10**[1]	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Heptachlor epoxide	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Methoxychlor	mg/kg	0.1	**500**[1]	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	o,p-DDD	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	o,p'-DDE	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	trans-Nonachlor	mg/kg	0.1	**0.01**[1]	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
Pesticides	Isodrin	mg/kg	0.1	**NE**	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Mirex	mg/kg	0.1	**20**[1]	**NE**	**NE**	**NE**	**NE**	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1

								Field ID	TP20 0.0-0.1	TP20 0.5-0.6	TP21 0.0-0.11	TP21 0.5-0.6	TP22 0.0-0.1	TP22 0.4-0.5	TP23 0.0-0.1	TP23 0.9-1.0	TP24 0.0-0.1	TP25 0.0-0.1
								Testpit Number	TP20	TP20	TP21	TP21	TP22	TP22	TP23	TP23	TP24	TP25
								Sample Depth	0-0.1	0.5-0.6	0-0.11	0.5-0.6	0-0.1	0.4-0.5	0-0.1	0.9-1	0-0.1	0-0.1
								Sample Date	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014	4/12/2014
								Lab Sample Number	SE134169.001	SE134169.002	SE134169.003	SE134169.004	SE134169.005	SE134169.006	SE134169.007	SE134169.008	SE134169.009	SE134169.010
Chem_Group	**ChemName**	**output unit**	**EQL**	1:NEPM 2013 Table 1A(1) HILs Res B Soil (1) & NEPM 2013 Table 1A(3) 2:Soil HSL for Vapour Intrusion (mg/kg) HSL B & NEPM 2013 Table 7 HSLs for asbestos contamination in soil - Residential B.	3: NEPM 2013 Table 1B(6) ESL's for Urban Residential Fine Soil	4: NEPM 2013 Table 1B (3) EIL's for Urban Residential Fine Soil	5: NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil	6: ACT Waste Classification Non-Liquid Waste Inert (4)											
Polycyclic Aromatic Hydrocarbons (PAH) & Phenols	Benzo[b+j]fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	1-Methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	2,4-dimethylphenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	2,4-dinitrophenol	mg/kg	2	NE	NE	NE	NE	NE	<2	-	<2	-	<2	-	<2	-	<2	<2
	2-methylnaphthalene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	2-methylphenol	mg/kg	0.5	NE	NE	NE	NE	400|4000|4000|16000	<0.5	-	1	-	<0.5	-	<0.5	-	<0.5	<0.5
	2-nitrophenol	mg/kg	0.5	NE	NE	NE	NE	NE	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	3-&4-methylphenol	mg/kg	1	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	4-chloro-3-methylphenol	mg/kg	2	NE	NE	NE	NE	NE	<2	-	<2	-	<2	-	<2	-	<2	<2
	4-nitrophenol	mg/kg	1	NE	NE	NE	NE	NE	<1	-	<1	-	<1	-	<1	-	<1	<1
	Acenaphthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Acenaphthylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Benz(a)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Benzo(a) pyrene	mg/kg	0.1	4[1]	0.7	NE	NE	0.08|0.8|0.8|3.2	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Benzo(g,h,i)perylene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Benzo(k)fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Chrysene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Cresol Total	mg/kg	1.5	4700[1]	NE	NE	NE	400|4000|4000|16000	<1.5	-	<1.5	-	<1.5	-	<1.5	-	<1.5	<1.5
	Dibenz(a,h)anthracene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Fluoranthene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Fluorene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Naphthalene	mg/kg	0.1	5[2]	NE	170	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Carcinogenic PAH's (As BaP TEQ)	mg/kg	0.1	4[1]	0.7	NE	NE	NE	<0.2	-	<0.2	-	<0.2		<0.2		<0.2	<0.2
	PAHs (Sum of total)	mg/kg	0.8	400[1]	NE	NE	NE	NE	<0.8	-	<0.8	-	<0.8	-	<0.8	-	<0.8	<0.8
	Phenanthrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Phenol	mg/kg	0.5	45000[1]	NE	NE	NE	28.8|288|288|1152	<0.5	-	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5
	Pyrene	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
Polychlorinated Biphenyls (PCBs)	Arochlor 1016	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1221	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1232	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1242	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1248	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1254	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1260	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Arochlor 1268	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Aroclor 1262	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	PCBs (Sum of total)	mg/kg	1	1[1]	NE	NE	NE	NE	<1	-	<1	-	<1	-	<1	-	<1	<1
Total Recoverable Hydrocarbons (TRH)	C10-C16	mg/kg	25	NE	NE	NE	1000	NE	<25	-	<25	-	<25	-	<25	-	<25	<25
	C16-C34	mg/kg	90	NE	1300	1300	2500	NE	<90	-	<90	-	<90	-	<90	-	<90	210
	C34-C40	mg/kg	120	NE	5600	5600	10,000	NE	<120	-	<120	-	<120	-	<120	-	<120	<120
	C6 - C9	mg/kg	20	NE	NE	NE	NE	NE	<20	-	<20	-	<20	-	<20	-	<20	<20
	C10 - C14	mg/kg	20	NE	NE	NE	NE	NE	<20	-	<20	-	<20	-	<20	-	<20	<20
	C15 - C28	mg/kg	45	NE	NE	NE	NE	NE	<45	-	<45	-	<45	-	<45	-	<45	160
	C29-C36	mg/kg	45	NE	NE	NE	NE	NE	<45	-	<45	-	<45	-	<45	-	<45	92
	+C10 - C36 (Sum of total)	mg/kg	110	NE	NE	NE	NE	NE	<110	-	<110	-	<110	-	<110	-	<110	250
	C10 - C40 (Sum of total)	mg/kg	210	NE	NE	NE	NE	NE	<210	-	<210	-	<210	-	<210	-	<210	250
	C6-C10	mg/kg	25	NE	NE	NE	NE	NE	<25	-	<25	-	<25	-	<25	-	<25	<25
	TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	280[2]	120	120	NE	NE	<25	-	<25	-	<25	-	<25	-	<25	<25
	TRH C37-C40	mg/kg	100	NE	NE	NE	NE	NE	<100	-	<100	-	<100	-	<100	-	<100	<100
Benzne Toluene Ethylbenzne Xylene(BTEX)	Benzene	mg/kg	0.1	0.7[2]	65	65	NE	1|10|10|40	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	NE	125	125	NE	60|600|600|2400	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Toluene	mg/kg	0.1	480	105	105	NE	28.8|288|288|1152	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Total BTEX	mg/kg	0.6	NE	NE	NE	NE	NE	<0.6	-	<0.6	-	<0.6	-	<0.6	-	<0.6	<0.6
	Xylene (m & p)	mg/kg	0.2	NE	NE	NE	NE	NE	<0.2	-	<0.2	-	<0.2	-	<0.2	-	<0.2	<0.2
	Xylene (o)	mg/kg	0.1	NE	NE	NE	NE	NE	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	<0.1
	Xylene Total	mg/kg	0.3	110[3]	45	45	NE	100|1000|1000|4000	<0.3	-	<0.3	-	<0.3	-	<0.3	-	<0.3	<0.3
	C6-C10 less BTEX (F1)	mg/kg	25	50[3]	180	180	700	NE	<25	-	<25	-	<25	-	<25	-	<25	<25
Faecal Coliforms	Faecal Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	Escherichia Coli Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-
	Total Coliform Count	Counts	200	NE	NE	NE	NE	NE	-	-	-	-	-	-	-	-	-	-

1. NEPM (1999, amended 2013) - Table 1A(1) 'Health investigation levels for soil contaminants of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater'*HIL B Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high rise buildings and flats'*..

2. NEPM (1999, amended 2013) - Table 1A(3) 'Soil HSLs for vapour intrusion of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater', HSL B Exposure Setting: Low to High Density Residential. Adopted value is for a clay soil at a depth of 0 m to <1 m.

3. NEPM (1999 amended 2013) - Table 1B (6) ESLs for TPH fractions F1-F4, BTEX and Benzo(a)Pyrene in soil of Schedule B1 'Guideline on Investigation Levels for Soil and Groundwater ', ESL setting urban residential and public open space.

4. NEPM (1999, amended 2013) - Table 1B (5) 'Generic EILs for aged As, Pb, fresh DDT and fresh napthalene in soil irrespective of the pyhysicochemical properties'.

5. NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Fine Soil

6. Environment ACT (2000) 'ACT's Environmental Standards Table A4: Assessment & Classification of Liquid & Non-liquid Waste'.

NE = Not established; NA = Not applicable; mg/kg = milligrams per kilogram; TEQ = Toxicity equivelant quotient.

Cell Shading = Exceedance of adopted assessment criteria.

9623 - Table 2
Soil QA/QC Restults
Stage 1 RESA - Canberra Brickworks Remediation Project

	SDG	SE134169-1	SE134169-1		120574		SE134376-1	SE134376-1		120901					SE134396-1	SE134396-1		120904	
	Field_ID	TP23 0.0-0.1	QC 1	RPD	QC2	RPD	TP5 0.0-0.1	QC 3	RPD	QC4	RPD	QC5	QC6	RPD	TP 14 0.9-1.0	QC7	RPD	QC8	RPD
	Sampled_Date-Time	4/12/2014	4/12/2014		4/12/2014		9/12/2014	9/12/2014							11/12/2014	11/12/2014			
Chem_Group	**ChemName**	**Units**	**EQL**																
Metals	Arsenic	mg/kg	3	6	7	15	8	29	7	8	13	6	15	6	<4	NC	6	5	18	6	0
	Cadmium	mg/kg	0.3	<0.3	<0.3	NC	<0.4	NC	0.4	0.4	0	<0.4	0	<0.3	<0.4	NC	<0.3	<0.3	NC	<0.4	29
	Chromium (III+VI)	mg/kg	0.3	20	19	5	25	22	18	19	5	19	5	25	23	8	24	17	34	28	15
	Copper	mg/kg	0.5	17	19	11	23	30	25	22	13	24	4	10	11	10	12	8.3	36	17	34
	Lead	mg/kg	1	27	26	4	28	4	170	99	**53**	120	34	28	23	20	31	16	**64**	21	38
	Mercury	mg/kg	0.01	0.02	0.02	0	<0.1	NC	0.04	0.04	0	<0.1	**NC**	0.03	<0.1	NC	0.04	<0.01	NC	<0.1	NC
	Nickel	mg/kg	0.5	11	13	17	20	**58**	18	18	0	20	11	7.8	13	50	8.9	9.4	5	16	**57**
	Zinc	mg/kg	0.5	49	53	8	62	23	260	250	4	250	4	25	26	4	38	220	**141**	250	**147**
PAH	Benzo[b+j]fluoranthene	mg/kg	0.1	<0.1	<0.1	0	-	-	0.2	<0.1	67	-	-	<0.1	-	0	<0.1	<0.1	0	-	0
	1-Methylnaphthalene	mg/kg	0.1	<0.1	<0.1	0	-	-	<0.1	<0.1	0	-	-	<0.1	-	0	<0.1	<0.1	0	-	0
	2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	0	-	-	<0.1	<0.1	0	-	-	<0.1	-	0	<0.1	<0.1	0	-	0
	Acenaphthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Acenaphthylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Benz(a)anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	0.2	<0.1	67	<0.1	67	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Benzo(a) pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.05	0	0.1	<0.1	0	<0.05	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.05	0
	Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	0	<0.2	0	<0.1	<0.1	0	<0.2	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.2	0
	Chrysene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Fluoranthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	0.4	<0.1	NC	<0.1	NC	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Fluorene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Naphthalene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	PAHs (Sum of total)	mg/kg	0.8	<0.8	<0.8	0	<0.1	0	2	<0.8	NC	<0.1	NC	<0.8	<0.1	0	<0.8	<0.8	0	<0.1	0
	Phenanthrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	0.3	<0.1	NC	<0.1	NC	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
	Pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	0	0.3	<0.1	NC	<0.1	NC	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0
Asbestos AF/FA	Asbestos in soil (>2mm to <7mm AF/FA)	0.001	<0.01	<0.01	0	<0.01	0	<0.01	<0.01	0	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	0
	Asbestos in soil (<2mm AF/FA)	0.001	<0.001	<0.001	0	<0.001	0	<0.001	0.010	18	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory.
NC: Not Calculable.

[Filter]

Lab Sample Number	SE134169.013	SE134376.0	SE134169.014	SE134376.016	SE134376.031	SE134396.036	SE134169.015	SE134376.017	SE134376.032	SE134396.037
Field_ID	R1	R2	Trip Blank 1	Trip Blank 2	Trip Blank 3	Trip Blank 4	Trip Spike 1	Trip Spike 2	Trip Spike 3	Trip Spike 4
Sampled_Date_Time	4/12/2014	9/12/2014	4/12/2014	9/12/2014	10/12/2014	11/12/2014	4/12/2014	8/12/2014	8/12/2014	11/12/2014

Method_Type	ChemName	output unit	EQL										
Metals	Mercury (Filtered)	mg/L	0.0001	0.0002	<0.0001	-	-	-	-	-	-	-	-
	Arsenic (Filtered)	mg/L	0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
	Cadmium (Filtered)	mg/L	0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-
	Chromium (III+VI) (Filtered)	mg/L	0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
	Copper (Filtered)	mg/L	0.001	0.003	0.004	-	-	-	-	-	-	-	-
	Lead (Filtered)	mg/L	0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
	Nickel (Filtered)	mg/L	0.001	<0.001	<0.001	-	-	-	-	-	-	-	-
	Zinc (Filtered)	mg/L	0.005	0.014	0.02	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAH)/Phenols	Benzo[b+j]fluoranthene	mg/L	0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-
	1-Methylnaphthalene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Acenaphthene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Acenaphthylene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Anthracene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Benz(a)anthracene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Benzo(a) pyrene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Chrysene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Dibenz(a,h)anthracene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Fluoranthene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Fluorene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Naphthalene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	PAHs (Sum of total)	µg/L	1	<1	<1	-	-	-	-	-	-	-	-
	Phenanthrene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
	Pyrene	µg/L	0.1	<0.1	<0.1	-	-	-	-	-	-	-	-
BTEX	Benzene	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	[91%]	[104%]	[105%]	[112%]
	Ethylbenzene	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	[94%]	[113%]	[116%]	[111%]
	Naphthalene	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-
	Toluene	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	[93%]	[113%]	[111%]	[105%]
	Total BTEX	mg/L	0.003	-	-	<0.003	<0.003	<0.003	<0.003	-	-	-	-
	Xylene (m & p)	µg/L	1	-	-	<1	<1	<1	<1	[96%]	[104%]	[106%]	[114%]
	Xylene (o)	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	[97%]	[111%]	[113%]	[113%]
	Xylene Total	µg/L	1.5	-	-	<1.5	<1.5	<1.5	<1.5	-	-	-	-
	C6 - C9	µg/L	40	-	-	<40	<40	<40	<40	-	-	-	-
	C6-C10 less BTEX (F1)	mg/L	0.05	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-
	C6-C10	mg/L	0.05	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-
	Dibromofluoromethane (Surrogate)	%	-	-	-	-	-	-	-	**94**	**95**	**94**	**115**
	d4-1,2-dichloroethane (Surrogate)	%	-	-	-	-	-	-	-	**91**	**94**	**93**	**118**
	d8-toluene (Surrogate)	%	-	-	-	-	-	-	-	**91**	**96**	**97**	**85**
	Bromofluorobenzene (Surrogate)	%	-	-	-	-	-	-	-	**111**	**106**	**108**	**103**

TABLE 4
ASBESTOS CONTENT IN SOIL

Project # : 9623	Date: December 2015
Project Name: Stage 1 Remediation and ESA - Canberra Brickworks Remediation Project	Field Personnel: AR and AM
Client: Capcorp Constrcutions Pty Ltd	Project Manager: BK

*WA (2009)Guidelines Soil Volume = 10 Litres

Location	**Weight of Soil** (kg)	**ACM (Y/N)** (Note the average fragment size and type of ACM ie lagging, asbestos cement)	**Weight of ACM** (kg)	**Density** (kg/L)	**% Asbestos Content** (for ACM unless a specific product is identified use 40%)	**% Soil Asbestos Site Criteria - HIL'B';0.04% w/w**
TP5 (1.9-2.0)	13.214		0.052	1.3214	40	0.12
TP6 (0.9-1.0)	14.7		0.034	1.47	40	0.06
TP13 (0.0-0.0)	11.97		0.42	1.197	40	1.17
TP13 (0.4-0.5)	13.78		0.2	1.378	40	0.42
TP13 (1.9-2.0)	13.45		0.288	1.345	40	0.64
TP13 (2.9-3.0)	12.826		0.122	1.2826	40	0.30

$$\% \text{ Soil in asbestos} = \frac{\% \text{ Asbestos Content} \times \text{ACM (kg)}}{\text{Soil Volume (L)} \times \text{Soil Density (kg/L)}}$$

General Guide to Asbestos Content of Common Building Materials

Product		**Approximate % Asbestos**
Cement Products		10-15%
Asbestos Millboard		15-40%
Asbestos Ropes and Cloth		100%
Lagging		6-85%

*Western Australia Department of Health (2009) 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia' (WA (2009)Guidelines)

9623 - TABLE 5
SITE SPECIFIC CRITERIA CALCULATIONS
Metals
Asbestos Dump - Canberra Remediation Project
(December 2014)

Laboratory Identification												**95% UCL**
Sample Identification		TP2	TP5	TP7	TP9	TP11	TP13	TP15	TP17	TP20	TP23	
Sample Depth		2.9-3.0	4.1-4.2	4.8-4.9	3.9-4.0	0.4-0.5	3.5-3.6	0.9-1.0	2.9-3.0	0.5-0.6	0.9-1.0	
Lithology		Sandy Clay	Sandy Clay	Weathered Granite	Sandy Clay	Sandy Clay	Sandy Clay	Gravelly Clay	Sandy Clay	Clayey Sand	Low Fill: Clayey Sand	
Sample Collection Date		9/012/2014	9/12/2014	10/12/2014	10/12/2014	11/12/2014	11/12/2014	10/12/2014	11/12/2014	4/12/2014	4/12/2014	
	Physicochemical Properties											
	CEC	13	12	11	8.8	5.6	6.9	6.7	14	6.4	14	
	Clay %	69	50	35	81	61	67	66	69	53	55	
	pH	6.5	6.5	6.5	6	5.5	4.8	6.2	6.7	7.0	7.7	
	Iron %	3.00	4.00	1.20	1.50	2.10	2.60	2.80	2.80	2.40	2.40	
	TOC %	0.24	0.05	0.12	0.32	0.47	0.43	0.11	0.18	0.56	1.30	
ABC mg/kg	**Analyte Criteria**											
21.13	Copper (mg/Kg)	85	35	50	80	80	55	45	75	140	220	**86**
8	Nickel (mg/Kg)	210	200	190	130	50	75	75	220	65	220	**169**
31.3	Cr(III) (mg/Kg)	790	710	630	830	760	780	770	790	720	730	***630**
31.8	Zinc (mg/Kg)	530	500	470	400	230	180	320	560	310	560	**451**

Additional Calculation Parameters/Information:

NSW — Clay % = < 75um

Low traffic volume — ABC: Ambient background concetrations derived from natural soils in Test Pits 20, 21, 24 and 25

Aged

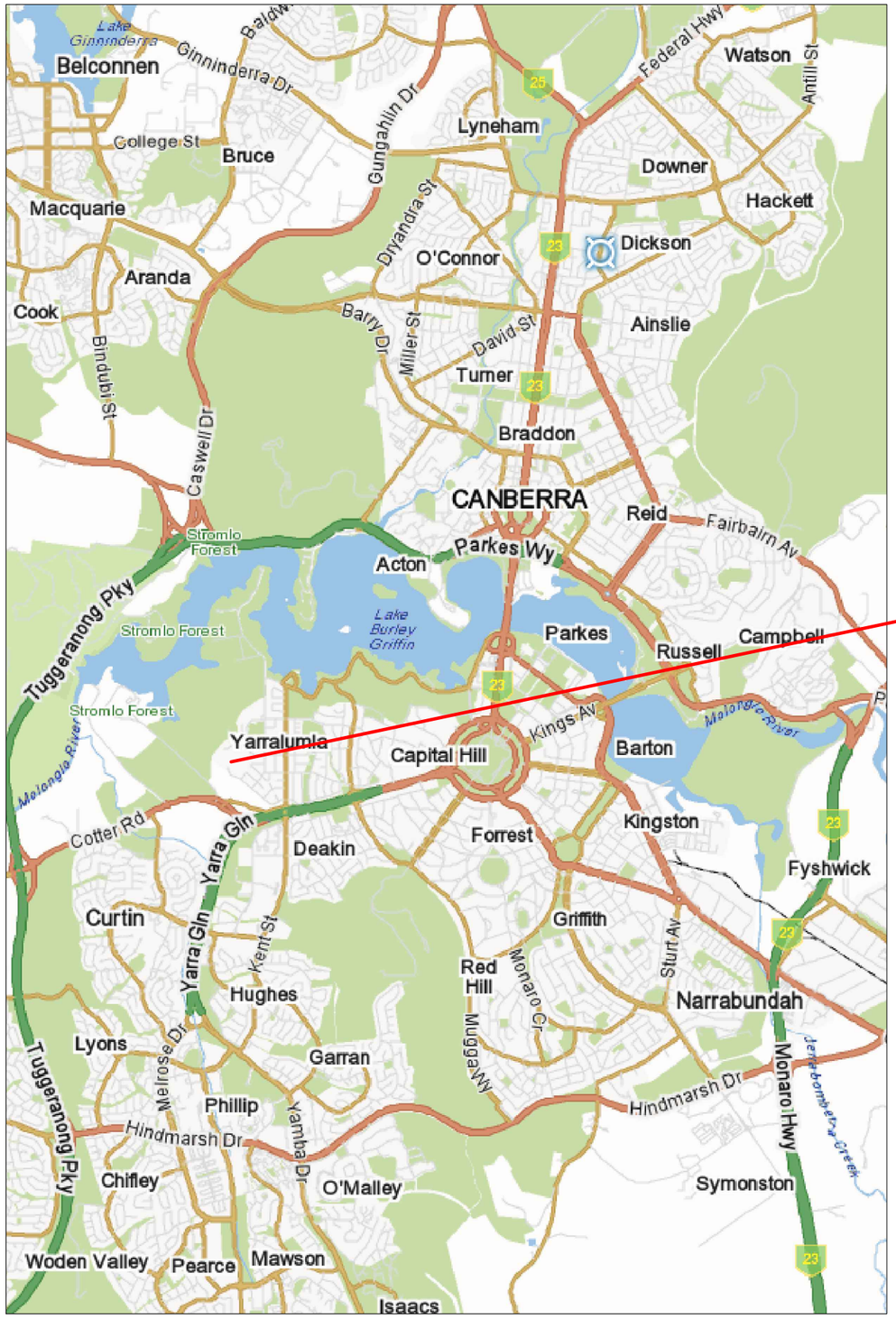
Urban Residential and Open Public Spaces; — Data derived from natural soil horizons

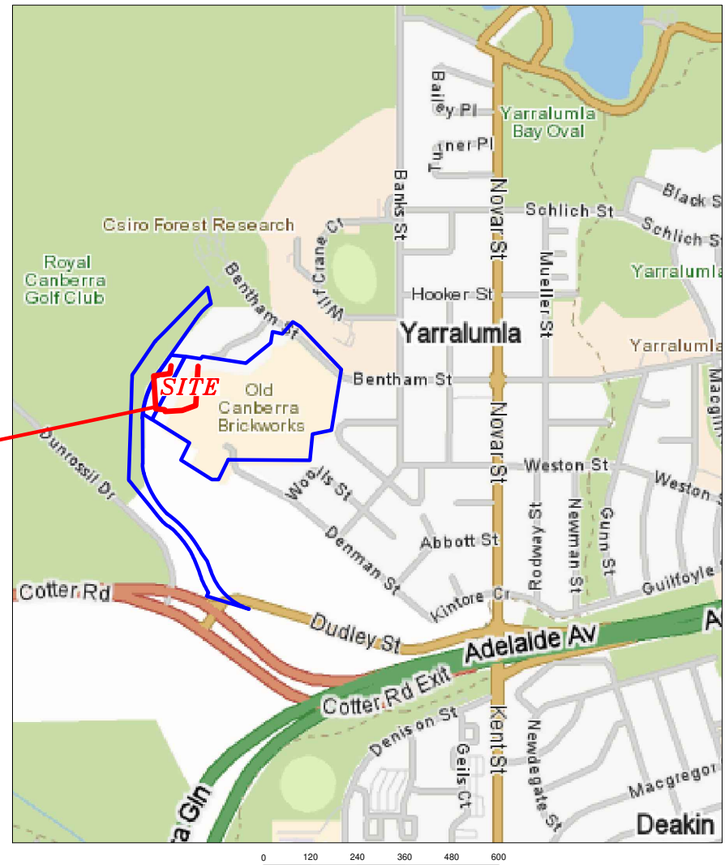
BOLD: Criteria derived from calculating 95% Upper Confidence Limit (UCL) of the calculated ACLs,

* 95%^UCL could not be calculated therefore the lowest concentration was selected as the site speciifc criterion.

FIGURES

Figures 1 to 6





LEGEND

BLOCK BOUNDARIES

SITE FENCE BOUNDARY

Note: Scale, locations, and boundaries are approximate only.
Images courtesy of Google Maps

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ABN: 55 008 660 900

Client:

CAPCORP CONSTRUCTIONS PTY LTD

Project:

CANBERRA BRICKWORKS STAGE 1 ESA

Location:

CANBERRA BRICKWORKS
(BLOCK 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127)
YARRALUMLA ACT 2600

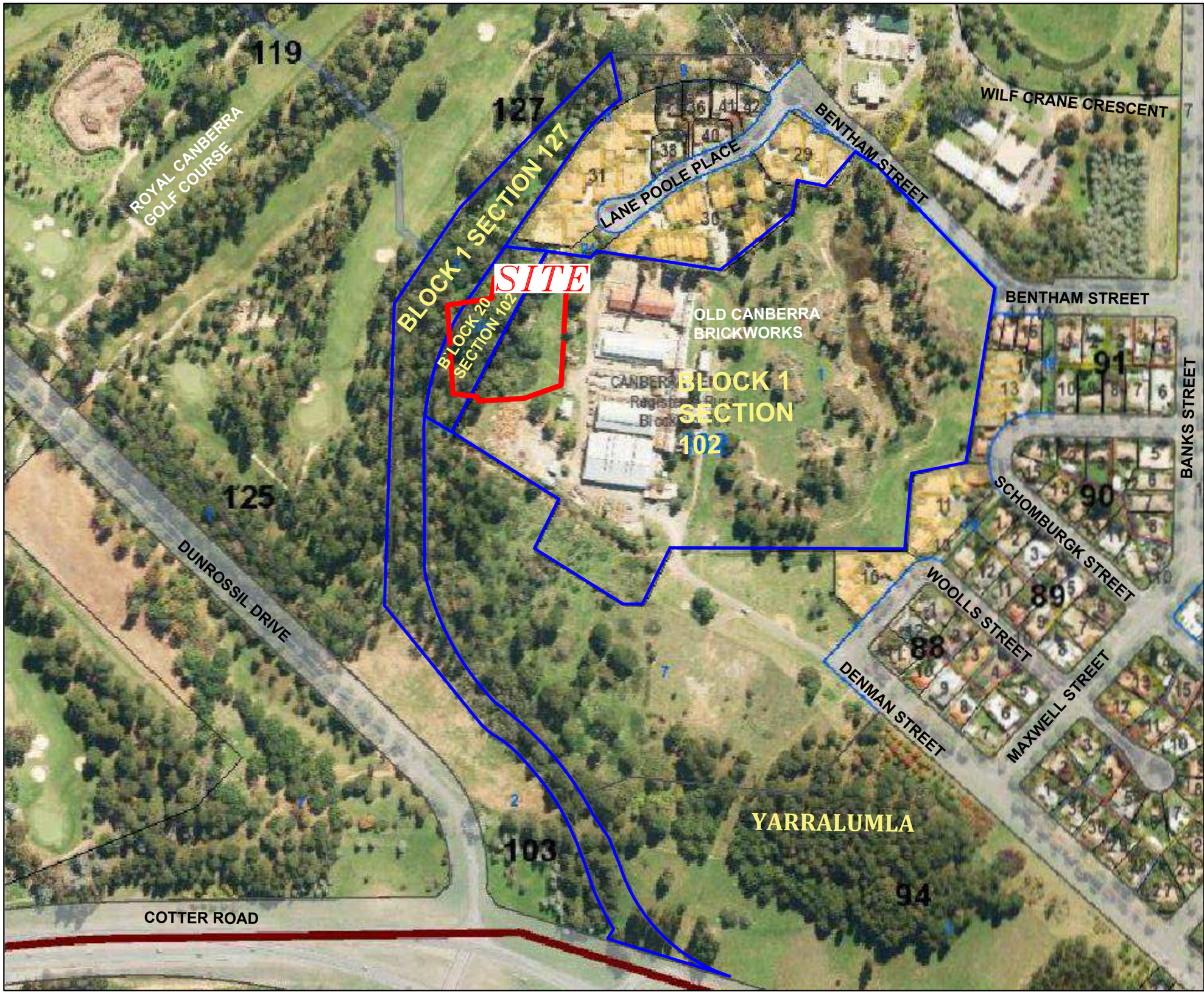
Drawing Title:

SITE LOCATION PLAN

Drawn S.W.	Signed	Date 02.02.15
Checked B.K.	Signed	Date 02.02.15

Rev	Date	Revision Details	Drn
A	02.02.15		S.W.

Project - Drawing No.	Figure No.	Rev.
9623	1	A



LEGEND

BLOCK BOUNDARIES

SITE FENCE BOUNDARY

0 30 60 90 120 150

APPROXIMATE SCALE METRES

Note: Scale, locations, and boundaries are approximate only.

Image courtesy of ACTMapi

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Client:

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Project:

CANBERRA BRICKWORKS STAGE 1 ESA

Location:

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(BLOCK 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127)
YARRALUMLA ACT 2600

Drawing Title:

GENERAL SITE PLAN

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Checked B.K.	Signed	Date 02.02.15	

Rev	Date	Revision Details	Drn
A	02.02.15		S.W.

Project - Drawing No.	Figure No.	Rev.
9623	2	A



LEGEND

- BLOCK BOUNDARIES
- SITE FENCE BOUNDARY
- APPROXIMATE FILL BOUNDARY
- APPROXIMATE FILL AND ACM BOUNDARY
- FILL LIKELY BEYOND BOUNDARY

0 12 24 36 48 60

APPROXIMATE SCALE METRES

Note: Scale, locations, and boundaries are approximate only.
Image courtesy of Nearmap 17.01.15

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Client:
ACT PROPERTY GROUP

Project:
CANBERRA BRICKWORKS
STAGE 1 ESA

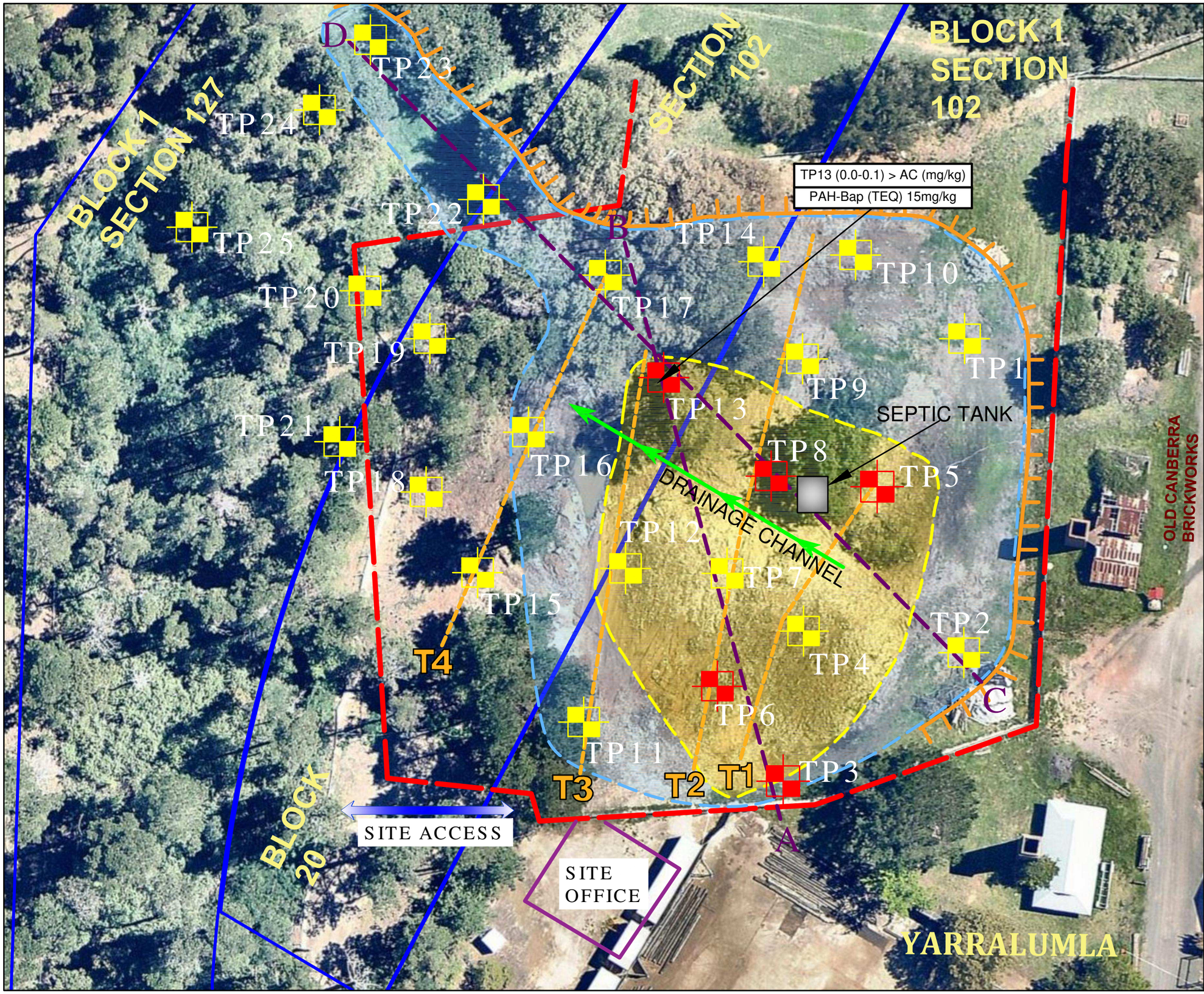
Location:
CANBERRA BRICKWORKS
(BLOCKS 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127)
YARRALUMLA ACT 2600

Drawing Title:
SAMPLE LOCATION PLAN

Drawn S.W.	Signed	Date 12.03.15	
Checked B.K.	Signed	Date 12.03.15	

Rev	Date	Revision Details	Drn
A	12.03.15		S.W.

Project - Drawing No.	Figure No.	Rev.
9623	3	A



LEGEND

- BLOCK BOUNDARIES
- SITE FENCE BOUNDARY
- TP5 — TESTPIT (TP) ASBESTOS CONTAINING MATERIAL (ACM) DETECTED
- TP2 — TEST PIT (TP) SAMPLE LOCATIONS
- T4 — TRENCH LOCATIONS
- A—B — CROSS SECTION
- APPROXIMATE FILL BOUNDARY
- APPROXIMATE FILL AND ACM BOUNDARY
- FILL LIKELY BEYOND BOUNDARY

0 6 12 18 24 30
APPROXIMATE SCALE METRES

Note: Scale, locations, and boundaries are approximate only.
Image courtesy of Nearmap 17.01.15

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Client:
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Project:
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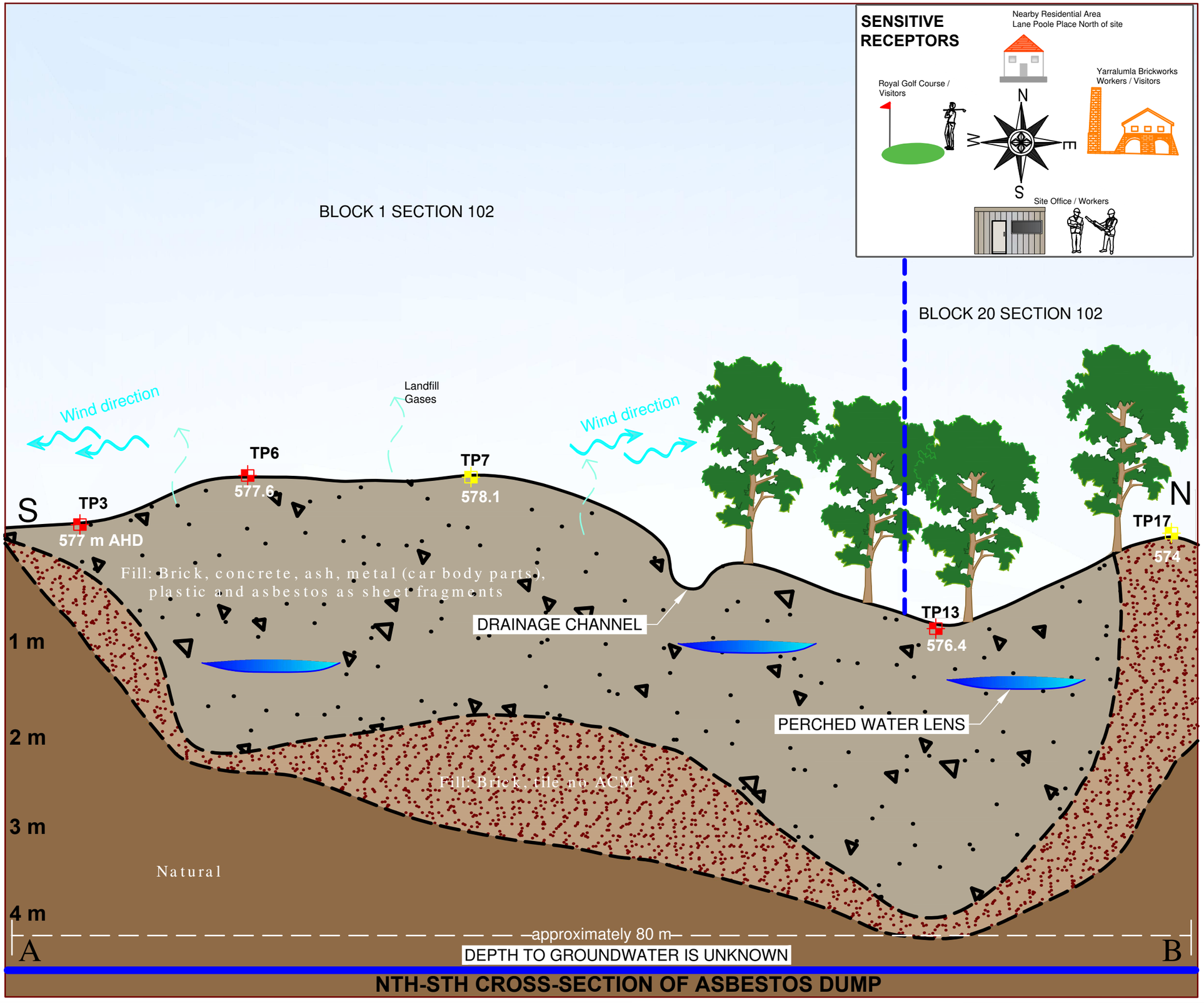
Location:
CANBERRA BRICKWORKS
(BLOCKS 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127)
YARRALUMLA ACT 2600

Drawing Title:
SAMPLE LOCATION PLAN

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Checked B.K.	Signed	Date 12.03.15	

Rev	Date	Revision Details	Drn
A	12.03.15		S.W.

Project - Drawing No.	Figure No.	Rev.
9623	4	A



LEGEND

TP6 Test Pit ACM observed

TP7 Test Pit no ACM observed

Block Boundary

Note: Not to Scale

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Client:
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Project:
CANBERRA BRICKWORKS STAGE 1 ESA

Location:
CANBERRA BRICKWORKS
(BLOCKS 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127)
YARRALUMLA ACT 2600

Drawing Title:
CONCEPTUAL SITE MODEL
CROSS SECTION A - B

Drawn S.W.	Signed	Date 18.03.15	
Checked B.K.	Signed	Date 18.03.15	

Rev	Date	Revision Details	Drn
A	18.03.15		S.W.

Project - Drawing No.	Figure No.	Rev.
9623	5	A

BLOCK 1 SECTION 102

BLOCK 20 SECTION 102

BLOCK 1 SECTION 127

SENSITIVE RECEPTORS

Nearby Residential Area
Lane Poole Place North of site

Royal Golf Course / Visitors

Yarralumla Brickworks Workers / Visitors

N

W

E

S

Site Office / Workers

Wind direction

SE

TP2

576.6 m AHD

TP5

576.4

TP8

575.8

Landfill Gases

TP13

576.9

TP17

575.4

TP22

TP23

SW

Wind direction

1 m

2 m

3 m

4 m

SEPTIC TANK

Fill: Brick, tile no ACM

Fill: Brick, concrete, ash, metal (car body parts), plastic and asbestos as sheet fragments

POSSIBLE SEEPAGE

PERCHED WATER LENS

Natural

C

D

approximately 115 m

STH EAST TO STH WEST CROSS-SECTION OF ASBESTOS DUMP

LEGEND

TP5 Test Pit ACM observed

TP2 Test Pit no ACM observed

Block Boundary

Note: Not to Scale

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Client:
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Project:
CANBERRA BRICKWORKS STAGE 1 ESA

Location:
CANBERRA BRICKWORKS
(BLOCKS 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127)
YARRALUMLA ACT 2600

Drawing Title:
CONCEPTUAL SITE MODEL
CROSS SECTION C - D

Drawn S.W.	Signed	Date 18.03.15	
Checked B.K.	Signed	Date 18.03.15	

Rev	Date	Revision Details	Drn
A	18.0315		S.W.

Project - Drawing No.	Figure No.	Rev.
9623	5A	A

A3

ROYAL CANBERRA GOLF COURSE

BLOCK 20 SECTION 102

BLOCK 1 SECTION 127

BLOCK 1 SECTION 102

SEDIMENT CONTROL FENCE

DRAINAGE LINE

FORKLIFT SHED

COAL AND OIL STORAGE

SEPTIC TANK

BH5 (2006)

SAMPLED AREA JUNE 2007

BH4 (2006)

ACCESS GATE

STORAGE AREA

SITE OFFICE

EXPLOSIVE STORE

STORAGE AREA

GRAVEL ACCESS ROAD

GRAVEL ACCESS ROAD

MAIN ENTRANCE

TO DENMAN STREET

CONCRETE FORECOURT

THIS IS ONE INTERPRETATION ONLY
OTHER INTERPRETATIONS ARE POSSIBLE

LEGEND

- BLOCK BOUNDARY
- BUILDINGS
- APPROXIMATE EXTENT OF ASBESTOS DUMP
- WORK AREA FENCELINE
- TREE / SHRUB / VEGETATION
- AREA IMPACTED BY SURFACE WATER DISPERSION OF ASBESTOS DUMP
- SEDIMENT CONTROL FENCE
- AEC'S (Connell Wagner 2001)
- BOREHOLE (2006)

N

0 5 10 15 20 25
SCALE METRES

NOTE: ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE ONLY

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Client:

CAPCORP CONSTRUCTIONS PTY LTD

Project:

CANBERRA BRICKWORKS STAGE 1 ESA

Location: CANBERRA BRICKWORKS (AREA OF CONCERN) (BLOCKS 1 & 20 SECTION 102 AND BLOCK 1 SECTION 127) YARRALUMLA ACT 2600

Drawing Title:

SAMPLE LOCATION EDITED PLAN (2006 Environmental Audit) and 2007 RAP

Drawn S.W.	Signed	Date 02.02.2015
Checked B.K.	Signed	Date 02.02.2015

Rev	Date	Revision Details	Drn
A	02.02.2015		S.W.

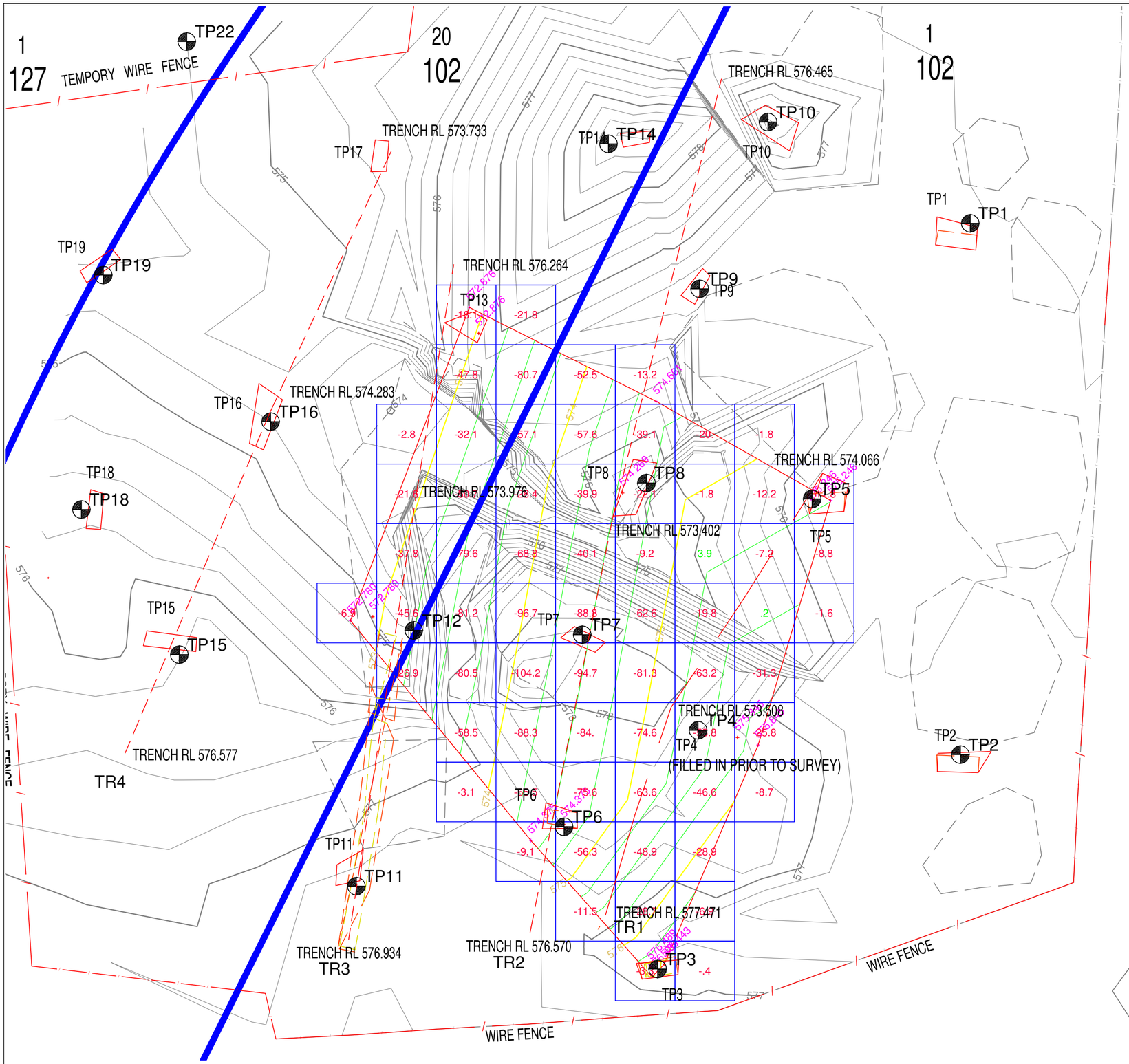
Project - Drawing No.	Figure No.	Rev.
9623	6	A

Figures 7 and 8

Source: 4D Surveying

(Figure 7: Volume A (Asbestos fill) Layer v Existing Surface – Plan No 18294_05_A.dwg)

(Figure 8: Volume B (Fill) Layer v Existing Surface – Plan No 18294_05_B.dwg)




```
                                05_AGC Surface Layer Volumes -
SURFACE TO SURFACE VOLUMES
==========================

PROJECT         : 05_AGC Surface Layer Volumes
DATE            : 27/01/2015
TIME            : 11:04:27 AM

================================

REGION          : Canberra Brickworks
--------------------------------

START SURFACE : 1 EXISTING SURFACE
FINISH SURFACE: 2 A LAYER SURFACE
MATERIAL      :
GRID INTERVAL : 1.000m
AREA          : 1260.00m²
CUT FACTOR    : 1.00
FILL FACTOR   : 1.00

CUT VOLUME    :     2619.5m³
FILL VOLUME   :        9.3m³

NET VOLUME    :     2610.1m³ CUT
--------------------------------
```

-2.2 5 metre x 5 metre GRID with NET Volume

EXISTING SURFACE CONTOURS BLOCK

DENOTES TEST PIT SURVEY 02.12.2014

IMPORTANT NOTE

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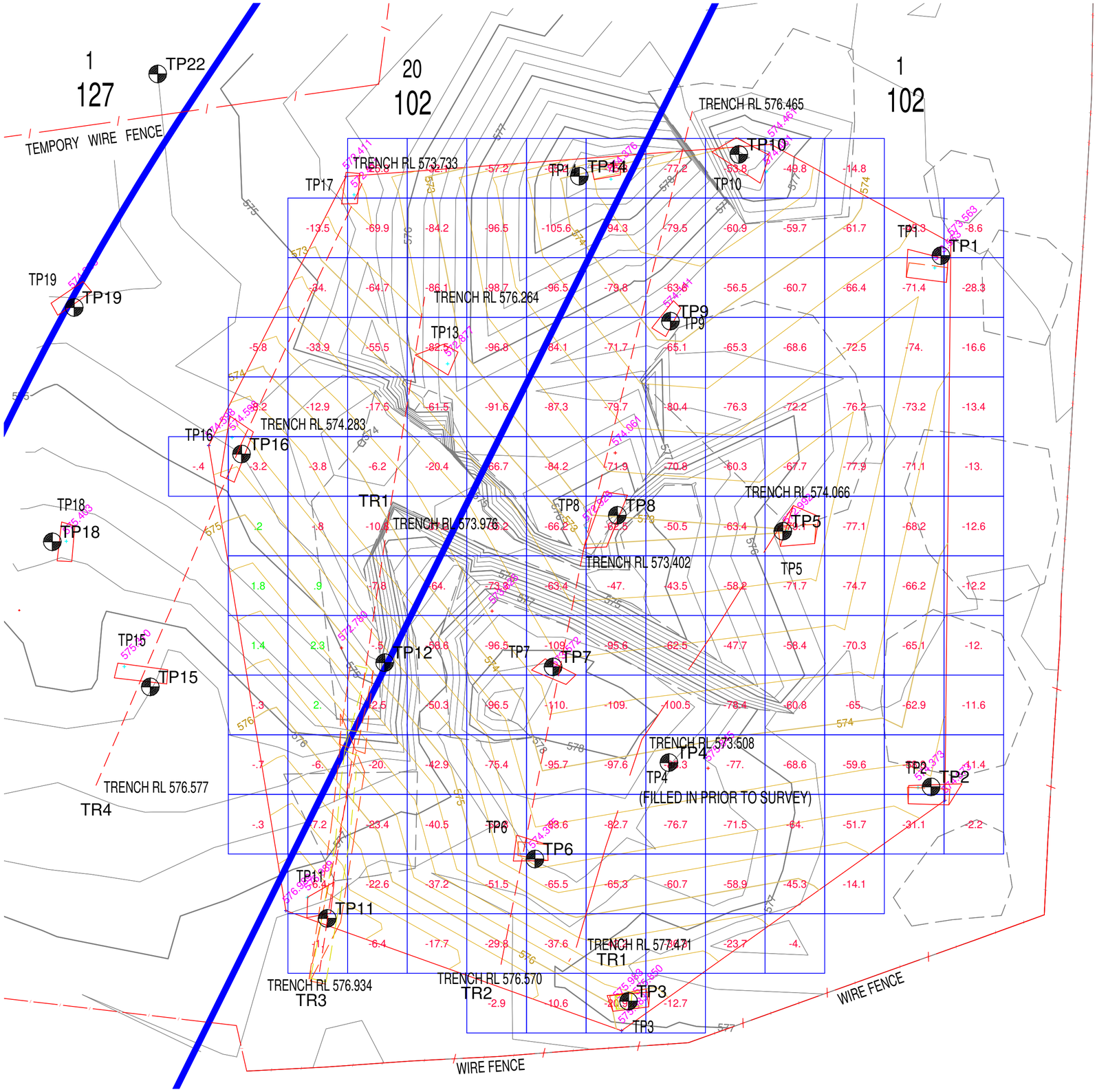
Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services. This note is an integral part of the plan.

Peter Williams
Registered Surveyor

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REDUCTION RATIO 1:250 A2	REVISIONS & AMENDMENTS	CLIENT: CAPCORP	SHEET No. 1
ORIGIN OF LEVELS SR 863 RL589.12 Contour Interval: 0.25m	Test Pit & Trenches added 29.01.2015	VOLUME A LAYER v EXISTING SURFACE CANBERRA BRICKWORKS DENHAM STREET YARRALUMLA	No. OF SHEETS:1
			DATE: 27.01.2015
DATUM: AHD & AGC	DRWN BY: PW SUR BY:		PLAN No. 18294_05_A.dwg




```
                                   05_AGC Surface Layer Volumes - B LAYER
SURFACE TO SURFACE VOLUMES
==========================

PROJECT         : 05_AGC Surface Layer Volumes
DATE            : 27/01/2015
TIME            : 11:09:48 AM

==================================

REGION          : Canberra Brickworks
---------------------------------

START SURFACE   : 1 EXISTING SURFACE
FINISH SURFACE: 3 B LAYER SURFACE
MATERIAL        :
GRID INTERVAL   : 1.000m
AREA            : 3722.00m²
CUT FACTOR      : 1.00
FILL FACTOR     : 1.00

CUT VOLUME      :      8748.9m³
FILL VOLUME     :        16.3m³

NET VOLUME      :      8732.6m³ CUT
---------------------------------
```

-2.2 5 metre x 5 metre GRID with NET Volume

EXISTING SURFACE CONTOURS BLOCK

DENOTES TEST PIT SURVEY 02.12.2014

IMPORTANT NOTE

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Peter Williams
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REDUCTION RATIO 1:250 A2	REVISIONS & AMENDMENTS	CLIENT: CAPCORP	SHEET No. 1
ORIGIN OF LEVELS SR 863 RL589.12 Contour Interval: 0.25m		VOLUME B LAYER v EXISTING SURFACE CANBERRA BRICKWORKS DENMAN STREET YARRALUMLA	No. OF SHEETS: 1 DATE: 27.01.2015
DATUM: AHD & AGC	DRWN BY: PW SUR BY:		PLAN No. 18294_05_B.dwg

APPENDICES

Appendices A to H

Appendix A

Data Quality Objectives

(Sourced from RAP- *Robson Reference* 9623_EAR_SAQP_20140916.docx*)*

4. DATA QUALITY OBJECTIVES

Assessment of the Data Quality Objectives (DQOs) is a process used to aid the planning of environmental investigations and remedial works by providing a structured methodology for assessing the environmental data collection processes, identification of sample locations, number of samples required, sampling techniques and defining acceptable assessment criteria.

The DQO process used to aid the development of this SAQP has been prepared in general accordance with Appendix C of the Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil – Part 1: Non-Volatile and Semi-Volatile Compounds*' and the US EPA (2000) '*Data Quality Objectives Process for Hazardous Waste Site Investigation*' (US EPA QA/G-4HW).

4.1 Define the Study Boundaries

The assessment area applicable to this SAQP is located within and adjacent to the foot print of the 'AD' on the western boundary of the Brickworks. The site is identified as parts of Blocks 1, 20 Section 102 Yarralumla and part of Block 1 Section 127 Yarralumla. The boundary of the waste has not been surveyed but is shown generally in **Figure 2**. The combined area is approximately 0.45 ha.

The vertical boundary is estimated to be approximately 3 metres below ground level (mbgl) (at its deepest point).

4.2 State the Problem

Previous assessments on the site have identified asbestos containing materials in the building rubble within the dump and asbestos concentrations in soil (in the form of asbestos fibre) at levels which are unacceptable for the proposed land use. In addition to the asbestos, low concentrations of Total Petroleum Hydrocarbons (TPH) (110mg/kg TPH - C_{29}-C_{36}) were identified in the soil sample taken from a test pit location in June 2007. Therefore, awareness for the potential of other contaminants of concern must be maintained and may require further assessment or remediation to manage this risk.

However, these assessments have not adequately characterised the dump to permit the development of an appropriate remediation strategy for the impacted land. Therefore the ESA is necessary as it will provide data specific to lateral and vertical extent of impact and allow further characterisation of the waste stream.

Project Team and Communication Plan

The project team is known in part and will generally include the following entities:

- Representatives from the ACT Property Group who are the custodians of the site and the primary decision makers;
- The Remediation contractor AAC Environmental Pty Ltd(AAC) who are responsible for the set-up of the site, for the remedial works (for example, site access and sediment control measures), provide plant and operators to

excavate the impacted soil, provide trucks for off-site haulage of impacted soil and undertake site reinstatement work;

- Contaminated land consultants from Robson, including a project manager and field staff who would provide on-site environmental consultancy advice during remedial and investigative works, including material tracking, airborne fibre monitoring, collection of samples from test pits and trenches;
- An ACT licensed asbestos removalist to be confirmed by AAC, will set up decontamination zones and supervise the loading and removal works;
- A NSW EPA accredited site Auditor who will be responsible for the review of the works undertaken by the consultant and effectively represents the ACT EPA to ensure the suitability of the site for the proposed land use;
- The ACT EPA who would be responsible for reviewing applications for the removal of soil from the dump location and final review of the Site Audit Statement to be provided by the Auditor on completion.

A summary of the team members involved is presented in **Table A** below.

Table A: Project Team and Communication Plan

Organisation / Role	Name / Title	Contact Details	
		Phone	Email
TAMS (ACTPG)	Mike Brown Senior Manager	02 6231 0700	Mike.brown@act.gov.au
	Katie Burrows Assistant Manager	02 6231 0700	Katie.burrows@act.gov.au
SSP Principal Representative for the Territory	Steve Hayden	02 6205 4651 0458 161 616	Steven.Hayden@act.gov.au
	Barry Ingham	02 62070037	barry.ingram@act.gov.au
	Michael Whitehouse	02 6205 3164	michael.whitehouse@act.gov.au
Capezio & Co P/L - Project Manager	Don Capezio Project Director	02 6239 1113	don@capezioandco.com.au
	Dylan Hughes Construction Manager	02 6239 1113	dylan@capezioandco.com.au

Organisation / Role	Name / Title	Contact Details	
		Phone	Email
	Ben Da Pozzo Site Manager Admin	02 6239 1113	ben@capezioandco.au
GeoSyntec/ NSW EPA Accredited Auditor	Lange Jorstad – Auditor	0447 249 250	LJorstad@Geosyntec.com
Earthworks and Construction (Remediation Contractor)	Arthur Watson - AAC Environmental Pty Ltd	02 6248 4326 M: 0419 629 864	awatson@aacenviro.com.au
Licensed Asbestos Removalist	TBA	TBA	TBA
Heritage / Archaeological Consultant	Shelley James Principal Consultant	(02) 6253 6888 (02) 6253 6804	Shelley.james@erm.com
Robson Environmental Pty Ltd – Environmental Consultant	Ben Kendon – Project Manager	(02) 6171 4623	0437 008 278
	Chris Gunton – Associate Environmental Scientist	(02) 6171 4619	0447 033 232
	Andrew Roberts – Site Manager	(02) 6171 4621	0437 009 369

Conceptual Site Model

Based upon the results of the previous assessments, it is assessed that all fill material within the footprint of the 'AD' which contains building waste should, until demonstrated otherwise, be considered to be impacted with unacceptable levels of ACM.

The 'AD' is an area that was used as a dump by both on-site personnel and may have also been used for illegal dumping activities. The bulk of the asbestos material is thought to have come from the site buildings during periods of renovation.

The potential on-site sensitive receptors of the COPCs include: on-site workers, visitors and trespassers while the off-site sensitive receptors include residents to the north of the 'AD' and the public who may access the adjacent public land or the adjacent Royal Canberra Golf course. Depending on the depth to groundwater, the water table is also considered to be a potential pathway for contamination as is surface water.

It is estimated that the volume of fill containing builders waste is in the order of 9,000 m^3 (in-situ, based upon an average depth of 2 m by the area of the dump (0.45 ha)) (refer **Figure 4**).

Future Exposure Scenarios

Potential receptors that may be exposed to contamination would include the following if remediation is not achieved:

- Construction and maintenance workers present during the construction works and ongoing maintenance of the site;
- Users / occupants of surrounding properties during the construction works and ongoing maintenance of the site;
- Future users and visitors to the site; and
- The potential for terrestrial organisms to be receptors is also considered and accounted for on the basis of the proposed site assessment criteria.

Potential exposure routes include via direct contact with contaminated soil, and by inhalation and / or ingestion of dust. Should contamination be migrating from the site, then neighbouring site users may be exposed to contaminants, particularly via inhalation and / or ingestion of dust.

4.3 Identify the Decision

Based on the previous assessments, it is understood that asbestos and low concentrations of hydrocarbon impacted soil is present on the site and that much of this material (potentially all) may require disposal off-site or reused. Assuming that the proposed soil assessment works are undertaken, the principal study questions are:

- "*Has the waste been adequately characterised and delineated both vertically and horizontally to give confidence that the remediation goals can be achieved*"

Soil Assessment for Site Use

- "*Does the soil on the site contain contaminant concentrations and / or other indicators of potential contamination that may pose an unacceptable risk to human health and / or the environment, thereby affecting the suitability of the site ('AD') for the proposed potential residential land use (HIL 'B' – High density residential)*"?

4.4 Identify Inputs to the Decision

A variety of data inputs have been identified to allow an informed and measured decision regarding the development of the SAQP. The inputs required are summarised in **Table B** below.

Table B: Identified Data Inputs for the SAQP

Data Input	Adequacy of Information
Historical Land Use	**Adequate** – Information is presented in the previous reports by Robson, particularly: • Connell and Wagner 2001 - *Appendix F-Brickworks Contamination Report* • Robson Laboratories Pty Ltd (October 2006) '*Environmental Investigation – Audit Report Yarralumla Brickworks Block 1 Section 102 Yarralumla Canberra Central ACT* (Robson reference 3144_ CL_EI Final_20061018). • Robson Laboratories Pty Ltd (2007) *'Remediation Action Plan - Asbestos Dump Yarralumla Brickworks Block 1 Section 102 Yarralumla Canberra Central ACT'* (Robson reference 3144_ CL_RAP_20070612).
Identification of Areas Requiring Assessment	**Generally Adequate** – The areas to be investigated include asbestos sheet materials and the associated impacted soil (fill containing building rubble) and the potential for hydrocarbons which has not been delineated laterally or vertically.
Identification of Contaminants	**Generally Adequate** – Appropriate contaminants of concern are defined in the previous Robson assessment reports. Specifically this includes asbestos and hydrocarbons.

Data Input	Adequacy of Information
Quantification of Contaminants in Soil	**Generally Adequate** – The concentrations of asbestos in soil have been broadly assessed, with all fill material containing building rubble assumed to be asbestos impacted. The lateral and vertical extent of the hydrocarbons and other potential contaminants of concern to be assessed during the ESA.

4.5 Develop a Decision Rule

4.5.1 Assessment Criteria for Soil

Investigation and screening level criteria as defined in the ASC NEPM (2013) are the concentrations of contaminants above which further assessment and /or appropriate remediation may be required.

Robson understands that the site is to be redeveloped for mixed-use high density residential and commercial land use. The assessment criteria applicable to this exposure scenario and sourced from the ASC NEPM (2013) are the Health-based Investigation Level (HIL) 'B'- *'Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high-rise buildings and flats'*.

The ASC NEPM 2013 also provides health screening levels (HSLs) for petroleum hydrocarbon compounds. It is considered that the dominant exposure pathway to petroleum hydrocarbon compounds would likely be via vapour inhalation, and therefore criteria sourced from Table 1A (3) have been adopted for the purpose of screening during this assessment.

In addition to the above, the ASC NEPM 2013 also provides ecological investigation levels (EILs) for common contaminants (including arsenic, copper, chromium (III), DDT, naphthalene, nickel, lead and zinc), and ecological screening levels (ESLs) for petroleum hydrocarbons (including benzene, toluene, ethylbenzene and xylene (BTEX), benzo(a)pyrene (B(a)P), and total recoverable hydrocarbon (TRH) fractions. The EILs and ESL should generally be applied to soil that will remain on the site and within the top two (2) metres (m) of the finished surface / ground level for generic land use. This generally corresponds to the root zone and habitation zone of many plant species.

For the purposes of this ESA it may not be necessary to assess the results against the EILs and ESLs as the material if assessed as unsuitable for site use which is expected, will either be assessed as suitable for BRU in a commercial/industrial setting or it will be disposed directly to land fill. However, the criteria have been included as possible assessment criteria in the event they are applicable.

EIL Ambient Background Concentrations (ABCs)

The Environmental Investigation Levels ambient background concentrations (ABCs) for copper, chromium (III), nickel, lead and zinc will be determined in the following manner.

In the first instance the EIL land use setting for the site is considered to be 'urban residential and public open space' therefore the protection level for this land use setting is 80%.

It is assumed that the ecosystem is adapted to the ABC for the locality and it adding the contaminants over and above the background concentration which has an adverse affect on the environment.

For this assessment samples are expected to be taken in natural soils in the dump, to the east and west (down gradient) of the dump (refer **Figure 6**). Robson considers these locations to be representative with regard to the ABCs for arsenic, copper, chromium (III), DDT, naphthalene, nickel, lead and zinc. If the assessment demonstrates exceedences with regard to the site specific EILs (using the ASC NEPM Toolbox) then additional testing may be required to derive the ABCs for the site.

Robson will also use historic soil data from across the Canberra Brickworks site which is available from the following 2006 Robson report:

- Robson Laboratories Pty Ltd (October 2006) '*Environmental Investigation – Audit Report Yarralumla Brickworks Block 1 Section 102 Yarralumla Canberra Central ACT.* (Robson reference 3144_ CL_EI Final_20061018).

The data will be used to compare with the results from the data collected in this investigation which will give confidence with regard to the derived ABCs.

HSLs, ESLs and TRH Management Limits

Based on the field observations (which are presented in **Section 3**) the soil sampled from the bore holes east of the dump and from the test pits within the dump were silty clay.

To assess the suitability of the soil in the vicinity of the dump, the HSL criteria for clay has been applied while the suitability of the soil with regards to ecological considerations has been assessed against the ESL criteria for fine soil texture. For the purpose of this assessment, the depth applied to establish the HSL criteria was 0 m to < 1 m which is considered appropriate as there is a high likelihood that soil will occur within this depth range.

Following the assessment of TRH (fractions F1 – F4) impacts with consideration given to the ESL and HSLs, the TRH Management Limits may also need to be considered and these shall be sourced (when required) from Table 1(B)7 *'Management Limits for TRH Fractions F1 – F4) in Soil'* of the ASC NEPM (2013). As the proposed land use includes a residential component, the residential, parkland and open space category with a 'fine' soil texture has been used to determine the TRH Management Limits criteria.

A summary of the adopted HILs and HSLs for the 'AD' assessment are presented below in **Table C**, and the adopted EILs and ESLs are summarised in the following **Table D** overleaf.

Table C: Proposed Soil Assessment Criteria (HILs and HSLs)

Contaminant	HIL B [1] (mg/kg)	HSL B[2](Clay) (mg/kg)
ACM	0.04 % w/w	NE
Fibrous Asbestos (FA)	0.001 % w/w	NE
Asbestos Fines (AF)	0.001 % w/w	NE
Benzene	NE	0.7
Ethylbenzene	NE	NL
Toluene	NE	480
Xylene (m & p)	NE	NE
Xylene (o)	NE	NE
Xylene Total	NE	110
F1 (TPH C_6 – C_{10} minus BTEX)	NE	50
F2 (TPH greater than (>) C_{10} - C_{16} minus naphthalene)	NE	280
Carcinogenic PAHs (as B(a)P TEQ)	4	NE
Napthalene	NE	5
PAHs (Sum of total)	400	NE
Phenol	45,000	NE
DDT+DDE+DDD	600	NE
Aldrin and dieldrin	10	NE
Chlordane	90	NE
Endosulfan	400	NE
Endrin	20	NE
HCB	15	NE
Heptachlor	10	NE
Methoxychlor	500	NE
Mirex	20	NE
Toxaphene	30	NE
PCBs (Sum of total)	1	NE
Arsenic (total)	500	NE
Cadmium	20	NE
Chromium (VI)	500	NE
Copper	30,000	NE
Lead	1,200	NE
Mercury (inorganic)	120	NE
Nickel	1200	NE
Zinc	60,000	NE

Notes:

1. ASC NEPM (2013) – Table 1A(1) '*Health investigation levels for soil contaminants*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HIL B Exposure

Setting: *'Residential with minimal opportunities for soil access including dwellings with fully and permanently paved yard space such as high-rise buildings and flats'*.

2. ASC NEPM (2013) – Table 1A (3) '*Soil HSLs for vapour intrusion*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HSL A & HSL B Exposure Setting: Low to high density residential. Adopted value is for a clay soil at a depth of 0 m to < 1 m.
NE = Not established, mg/kg = milligrams per kilogram, TEQ = toxicity equivalent quotient, PAH = Polycyclic Aromatic Hydrocarbons

Table D: Proposed Soil Assessment Criteria (EILs and ESLs)

Contaminant	EIL[1] (mg/kg)	ESL[2] (Fine) (mg/kg)
Benzene	NE	65
Ethylbenzene	NE	125
Toluene	NE	105
Xylene (m & p)	NE	NE
Xylene (o)	NE	NE
Xylene Total	NE	45
F1 (TPH C_6 – C_{10} minus BTEX)	NE	180 (800[4])
F2 (TPH greater than (>) C_{10} - C_{16})	NE	120 (1,000[4])
F3 (TPH > C_{16} - C_{34})	NE	1,300 (3,500[4])
F4 (TPH > C_{34} - C_{40})	NE	5,600 (10,000[4])
Carcinogenic PAHs (as B(a)P)	NE	0.7
Napthalene	170	NE
PAHs (Sum of total)	NE	NE
Phenol	NE	NE
DDT	180	NE
Aldrin and dieldrin	NE	NE
Chlordane	NE	NE
Endosulfan	NE	NE
Endrin	NE	NE
HCB	NE	NE
Heptachlor	NE	NE
Methoxychlor	NE	NE
Mirex	NE	NE
Toxaphene	NE	NE
PCBs (Sum of total)	NE	NE
Arsenic (total)	100	NE
Cadmium	NE	NE
Chromium (III)	190 – 400 (TBD)	NE
Copper	60 – 800 (TBD)	NE
Lead	1,100	NE
Mercury (inorganic)	NE	NE
Nickel	30 – 560 (TBD)	NE
Zinc	70 – 1300 (TBD)	NE

Notes:

1. ASC NEPM (2013) – Table 1B (5) '*Generic EILs for aged As, Pb, fresh DDT and fresh naphthalene in soil irrespective of their physicochemical properties*'.
2. ASC NEPM (2013) – Table 1B(6) *'ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)Pyrene in soil*' of Schedule B1 *'Guideline on Investigation Levels for Soil and Groundwater*', ESL setting urban residential and public open space.
3. ASC NEPM (2013) – ASC NEPM Toolbox, '*Ecological Investigation Levels – Interactive (Excel) Calculation Spreadsheet*'. Assuming the heavy metals are aged, that is, greater than two (2) years old. Soil physiochemical properties required to calculate EILs for Cu, Ni, CrIII and Zn (refer TBD below).
4. ASC NEPM (2013) Table 1B(7) *'Management Limits for TPH fractions F1-F4 in soils';* Soil texture 'fine', residential, parkland and open public space exposure setting.

NE: Not established, mg/kg = milligrams per kilogram.

TBD: **TBD:** To be determined**. Note:** These concentration ranges are Added Contaminant Limits (ACLs) and the Ambient Background Concentrations (ABCs) when determined must be added to determine the EIL.

The standard laboratory analysis for chromium provides a total concentration (that is, the result is unspeciated for chromium (III) and chromium (VI)). As the HIL 'B' assessment criteria for chromium (VI) is 500 mg/kg, it was considered that should the measured concentration of total chromium exceed this, then the sample would be re-analysed and speciated to measure the chromium (VI) concentration.

Statistical Evaluation

Statistical evaluation of soil analytical results may be necessary in the event of exceedences of the adopted assessment criteria. Statistical analysis should adhere to the following criteria:

- No single analytical result is to be greater than 250 % of the site criterion;
- The arithmetic mean of sample analytical results must be below the site criterion;
- The standard deviation must be less than 50 % of the site criterion.

It must also be emphasised that in the NSW EPA (1995) '*Sampling Design Guidelines*' that a site or sampling area cannot be considered to be uncontaminated or successfully remediated if the 95 % Upper Confidence Limit (UCL) of the arithmetic average concentration exceeds the assessment criterion. The 95 % UCL will therefore be considered as a primary tool to establish the efficacy of future remedial works.

Evaluation of Soil Assessment Criteria

Envirolab Pty Ltd (Envirolab) is the proposed primary laboratory, while SGS Services Pty Ltd (SGS) is the proposed secondary laboratory. Both laboratories are NATA endorsed for the proposed analytical suite.

The limits of laboratory reporting (LOR) for the analytical methods used by the primary laboratory were compared with the proposed assessment criteria. This was to ensure that the assessment criteria values exceeded the laboratory LOR. The results of the comparison are presented overleaf in **Tables E and F.**

Table E. Comparison of the Laboratory LOR with the Proposed Soil Assessment Criteria (HILs and HSLs)

Contaminant	HIL B [1] (mg/kg)	HSL B[2](Clay) (mg/kg)	Laboratory LOR (mg/kg)
Asbestos			
ACM	0.04 % w/w	NE	**0.1 g/kg (0.01 % w/w)**
Fibrous Asbestos (FA)	0.001 % w/w	NE	**0.1 g/kg (0.01 % w/w)**
Asbestos Fines (AF)	0.001 % w/w	NE	**0.1 g/kg (0.01 % w/w)**
Hydrocarbons			
Benzene	NE	0.7	0.2
Ethylbenzene	NE	NL	1
Toluene	NE	480	0.5
Xylene (m & p)	NE	NE	2
Xylene (o)	NE	NE	1
Xylene Total	NE	110	3
F1 (TPH C_6 – C_{10} minus BTEX)	NE	50	25
F2 (TPH greater than (>) C_{10} - C_{16} minus naphthalene)	NE	280	50
Polycyclic Aromatic Hydrocarbons (PAHs)			
Carcinogenic PAHs (as B(a)P TEQ)	4	NE	0.05
Napthalene	NE	5	0.1
PAHs (Sum of total)	400	NE	1.55
Phenol	45,000	NE	0.2
Organochlorine Pesticides			
DDT+DDE+DDD	600	NE	0.3
Aldrin and dieldrin	10	NE	0.2
Chlordane	90	NE	0.1
Endosulfan	400	NE	0.1
Endrin	20	NE	0.1
HCB	15	NE	0.1
Heptachlor	10	NE	0.1
Methoxychlor	500	NE	0.1
Mirex	20	NE	0.5
Toxaphene	30	NE	NA
PCBs (Sum of total)	1	NE	0.7
Metals			
Arsenic (total)	500	NE	4
Cadmium	20	NE	0.4
Chromium (VI)	500	NE	1
Copper	30,000	NE	1
Lead	1,200	NE	1
Mercury (inorganic)	120	NE	0.1
Nickel	1200	NE	1
Zinc	60,000	NE	1

Notes:

Bold: LOR is greater than the assessment criteria.

Table F. Comparison of the Laboratory LOR with the Proposed Soil Assessment Criteria (EILs and ESLs)

Contaminant	EIL[1] (mg/kg)	ESL[2] (Fine) (mg/kg)	Laboratory LOR (mg/kg)
Hydrocarbons			
Benzene	NE	65	0.2
Ethylbenzene	NE	125	1
Toluene	NE	105	0.5
Xylene (m & p)	NE	NE	2
Xylene (o)	NE	NE	1
Xylene Total	NE	45	3
F1 (TPH C_6 – C_{10} minus BTEX)	NE	180	25
F2 (TPH greater than (>) C_{10} - C_{16})	NE	120	50
F3 (TPH > C_{16} - C_{34})	NE	1300	100
F4 (TPH > C_{34} - C_{40})	NE	5600	100
Polycyclic Aromatic Hydrocarbons (PAHs)			
Carcinogenic PAHs (as B(a)P)	NE	0.7	0.05
Napthalene	170	NE	0.1
PAHs (Sum of total)	NE	NE	1.55
Phenol	NE	NE	0.2
Organochlorine Pesticides			
DDT	180	NE	0.3
Aldrin and dieldrin	NE	NE	0.2
Chlordane	NE	NE	0.1
Endosulfan	NE	NE	0.1
Endrin	NE	NE	0.1
HCB	NE	NE	0.1
Heptachlor	NE	NE	0.1
Methoxychlor	NE	NE	0.1
Mirex	NE	NE	0.5
Toxaphene	NE	NE	NA
PCBs (Sum of total)	NE	NE	0.7
Metals			
Arsenic (total)	100	NE	4
Cadmium	NE	NE	0.4
Chromium (III)	190 – 400 (TBD)	NE	1
Copper	60 – 800 (TBD)	NE	1
Lead	1,100	NE	1
Mercury (inorganic)	NE	NE	0.1
Nickel	30 – 560 (TBD)	NE	1
Zinc	70 – 1300 (TBD)	NE	1

Notes:
Bold: LOR is greater than the assessment criteria.
TBD: To be determined**. Note:** These concentration ranges are Added Contaminant Limits (ACLs) and the Ambient Background Concentrations (ABCs) when determined must be added to determine the EIL.

With regards to the asbestos criteria and laboratory LORs, it is noted from the Australian Standard AS4964-2004 '*Method for the Qualitative Identification of Asbestos in Bulk Samples*', which is a NATA accredited method for qualitative identification of asbestos in bulk samples, that the limit of reporting (LOR) of asbestos by the laboratory is 0.1 g/kg, which is equivalent to 0.01 % weight per weight (% w/w). That is, the assessment criteria for FA and AF are therefore below the laboratory LOR. Other analytical methods for the detection of asbestos which can achieve the required FA and AF criteria are not NATA accredited methods but should be considered appropriate if required.

In the interim it is noted that the laboratories used do report in their comments section of the analytical report whether asbestos was detected but at concentrations below the LOR. If such a comment is made a precautionary approach will be adopted and the sample will be considered to exceed the assessment criteria. On the other hand, if the result is reported as being below the LOR and no additional comment is provided then the sample result will be considered to be below the assessment criteria.

Based on the review, the laboratory LOR for each analyte is considered suitable for the purpose of this SAQP.

4.5.2 Classification of Soil for Off-Site Beneficial Re-Use

To permit flexibility with regard to the assessment of data collected during the ESA it may be possible to consider Beneficial Re-Use (BRU) of soil on a commercial/industrial site based on the results of the assessment.

Material assessed as unsuitable for on-site use may be suitable for BRU on other properties within the ACT (most likely day cover at the West Belconnen Resource Management Centre (WBRMC) or commercial / industrial properties).

The criteria considered to be applicable for the assessment of the material for BRU on commercial / industrial properties are the NEPM HIL 'D' which includes premises such as shops and offices as well as factories and industrial sites. HSL 'D' and ESL 'Fine' would be applied to assess hydrocarbon impacts when required. The proposed soil criteria for assessment for off-site BRU are summarised below in **Tables G and H**.

Table G: Proposed Assessment Criteria for Off-Site Beneficial Re-Use (HIL and HSL)

Contaminant	HIL D [1] (mg/kg)	HSL D[2](Clay) (mg/kg)	WA Guideline[2] (% w/w)
ACM	NE	NE	0.05
Fibrous Asbestos (FA)	NE	NE	0.001
Asbestos Fines (AF)	NE	NE	0.001
Benzene	NE	4	NA
Ethylbenzene	NE	NE	NA
Toluene	NE	NE	NA

Contaminant	HIL D [1] (mg/kg)	HSL D[2](Clay) (mg/kg)	WA Guideline[2] (% w/w)
Xylene (m & p)	NE	NE	NA
Xylene (o)	NE	NE	NA
Xylene Total	NE	NL	NA
F1 (TPH C_6 – C_{10} minus BTEX)	NE	310	NA
F2 (TPH greater than (>) C_{10} - C_{16} minus naphthalene)	NE	NE	NA
Carcinogenic PAHs (as B(a)P TEQ)	40	NE	NA
Napthalene	NE	NL	NA
PAHs (Sum of total)	4000	NE	NA
Phenol	240000	NE	NA
DDT+DDE+DDD	3600	NE	NA
Aldrin and dieldrin	45	NE	NA
Chlordane	530	NE	NA
Endosulfan	2000	NE	NA
Endrin	100	NE	NA
HCB	80	NE	NA
Heptachlor	50	NE	NA
Methoxychlor	2500	NE	NA
Mirex	100	NE	NA
Toxaphene	150	NE	NA
PCBs (Sum of total)	7	NE	NA
Arsenic (total)	3000	NE	NA
Cadmium	900	NE	NA
Chromium (VI)	3600	NE	NA
Copper	240000	NE	NA
Lead	1500	NE	NA
Mercury (inorganic)	730	NE	NA
Nickel	6000	NE	NA
Zinc	400000	NE	NA

Notes:

1. NEPM (1999, amended 2013) – Table 1A(1) '*Health investigation levels for soil contaminants*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HIL D commercial/industrial such as shops, offices, factories and industrial sites
2. NEPM (1999, amended 2013) – Table 1A(3) '*Soil HSLs for vapour intrusion*' of Schedule B1 '*Guideline on Investigation Levels for Soil and Groundwater*', HSL D Exposure Setting: Commercial and Industrial. Adopted value is for a clay soil at a depth of 0 m to < 1 m.

NE = Not established; NA = Not Applicable; mg/kg = milligrams per kilogram; TEQ = toxicity equivalent quotient;
PAH = Polycyclic Aromatic Hydrocarbons

Table H: Proposed Assessment Criteria for Off-Site Beneficial Re-Use (EIL and ESL)

Contaminant	EIL[1] (mg/kg)	ESL[2] (Fine) (mg/kg)
Benzene	NE	95
Ethylbenzene	NE	185
Toluene	NE	135
Xylene (m & p)	NE	NE
Xylene (o)	NE	NE
Xylene Total	NE	95
F1 (TPH C_6 – C_{10} minus BTEX)	NE	215
F2 (TPH greater than (>) C_{10} - C_{16})	NE	170
F3 (TPH > C_{16} - C_{34})	NE	2500
F4 (TPH > C_{34} - C_{40})	NE	6600
Carcinogenic PAHs (as B(a)P)	NE	1.4
Napthalene	370	NE
PAHs (Sum of total)	NE	NE
Phenol	NE	NE
DDT	640	NE
Aldrin and dieldrin	NE	NE
Chlordane	NE	NE
Endosulfan	NE	NE
Endrin	NE	NE
HCB	NE	NE
Heptachlor	NE	NE
Methoxychlor	NE	NE
Mirex	NE	NE
Toxaphene	NE	NE
PCBs (Sum of total)	NE	NE
Arsenic (total)	160	NE
Cadmium	NE	NE
Chromium (III)	190 – 400 (TBD)	NE
Copper	60 – 800 (TBD)	NE
Lead	1800	NE
Mercury (inorganic)	NE	NE
Nickel	30 – 560 (TBD)	NE
Zinc	70 – 1300 (TBD)	NE

Notes:

1. NEPM (1999, amended 2013) – Table 1B (5) '*Generic EILs for aged As, Pb, fresh DDT and fresh naphthalene in soil irrespective of their physicochemical properties*'.
2. NEPM (1999, amended 2013) – Table 1B (6) *'ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)Pyrene in soil'* of Schedule B1 *'Guideline on Investigation Levels for Soil and Groundwater'*, ESL setting commercial and industrial.
3. NEPM (1999, amended 2013) – ASC NEPM Toolbox, '*Ecological Investigation Levels – Interactive (Excel) Calculation Spreadsheet*'. Assuming the heavy metals are aged, that is, greater than two (2) years old. Soil physiochemical properties required to calculate EILs for CrIII, Cu, Ni, and Zn (refer TBD below).

NE: Not established.
mg/kg = milligrams per kilogram.

NL: Non-limiting.
TBD: To be determined**. Note:** These concentration ranges are Added Contaminant Limits (ACLs) and the Ambient Background Concentrations (ABCs) when determined must be added to determine the EIL.

4.5.3 Classification of Waste Soil for Off-Site Disposal

To permit flexibility with regard to the assessment of data collected during the ESA it may be possible to consider Waste Classification from this in-situ assessment and is therefore discussed in this section.

Soil material that is considered to be unsuitable for off-site BRU at a commercial and industrial site would be disposed at a licensed waste facility in the ACT in accordance with the criteria presented in Environment ACT (2000) '*ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Waste*', a summary of which is provided below in **Table I**. It is also noted that soil potentially impacted with asbestos is to be classified as an '*asbestos contaminated waste*' and would therefore require removal in accordance with ACT EPA Contaminated Sites Information Sheet No. 5 (2011) '*Requirements for the Transport and Disposal of Asbestos Contaminated Wastes*'.

Table I: Soil Waste Assessment Criteria

Contaminant	Waste Classification (Environment ACT Table A3)[1] (mg/kg)		
	Inert	Solid	Industrial
Hydrocarbons (BTEX and TPH)			
Benzene	1	10	40
Ethylbenzene	60	600	2400
Toluene	28	288	1152
Xylene (m & p)	NE	NE	NE
Xylene (o)	NE	NE	NE
Xylene Total	100	1000	4000
TPH (C_6 – C_{10})	650	650	2600
TPH (C_{10} – C_{40})	5000	10000	40000
Polycyclic Aromatic Hydrocarbons (PAHs)			
Naphthalene	NE	NE	NE
Carcinogenic PAHs (as B(a)P TEQ)	0.08	0.8	3.2
PAHs (Sum of total)	200	200	800
Total Phenolics			
Phenol (non-halogenated)	28	288	1152
Organochlorine Pesticides			
DDT	NE	NE	NE

Contaminant	Waste Classification (Environment ACT Table A3)[1] (mg/kg)		
	Inert	Solid	Industrial
Aldrin and dieldrin	NE	NE	NE
Chlordane	NE	NE	NE
Endosulfan	NE	NE	NE
Endrin	NE	NE	NE
HCB	NE	NE	NE
Heptachlor	NE	NE	NE
Methoxychlor	NE	NE	NE
Mirex	NE	NE	NE
Toxaphene	NE	NE	NE
Polychlorinated Biphenyls			
PCBs (Sum of total)	2	<50	<50
Metals			
Arsenic	10	100	400
Cadmium	2	20	80
Chromium (III)	NE	NE	NE
Chromium (VI)	10	100	400
Copper	NE	NE	NE
Lead	10	100	400
Mercury (inorganic)	0.4	4	16
Nickel	4	40	160
Zinc	NE	NE	NE

Notes to Table M:
NE: Not established
[1] CT: Contaminant Threshold values for waste classification without doing the leachate test.

With regards to the above, it is noted that if exceedences of the Solid Waste Classification criteria of Table A3 are recorded, then additional laboratory analysis to determine the leachability of samples (using the Toxicity Characteristic Leaching Procedure (TCLP) may be undertaken, with the results then being compared against criteria sourced from Table A4 of Environment ACT (2000) '*ACT's Environmental Standards: Assessment & Classification of Liquid & Non-liquid Waste*'.

4.5.4 Water Assessment Criteria

In the event water is encountered during the investigation water samples will be taken. To assess the water for site use purposes assessment criteria must be established and are discussed and presented below.

Consideration has been given to the potential uses of water in the surrounding area (the golf course) and to the nearest receiving water body, the Warrina Inlet of Lake Burley Griffin located approximately 600m northwest of the site, in determining the groundwater investigation levels (GIL). The potential contamination risks related to the groundwater are considered in general accordance with the ACT Ambient Environmental Standards presented in the ACT *Environment Protection Regulation 2005*, with consideration also given to the NSW DEC (2007) '*Guidelines for the Assessment and Management of Groundwater Contamination*' for ecological protection.

Figure 1 of the ACTPLA Territory Plan (2009) '*Water Use and Catchment General Code*' indicates that the site is located within the Yarralumla Catchment area designated as 'Urban Area'. Purposes for which water may be used and the prescribed environmental values for this catchment area only include discharge to stormwater which is the most applicable for the site. However, as Warrina Inlet of Lake Burley Griffin is the nearest receiving water body, its catchment designation has also been considered when setting the assessment criteria.

Warrina Inlet is near Yarramundi Reach at the west end of the lake which is designated as a Conservation Catchment within Molonglo. Therefore, the following values must be considered which include recreational use (REC/2), waterscape (VIEW), aquatic habitat – mountain streams (AQUA/1), and discharge (diverted stormwater).

However, with consideration given to the location of the site, the likelihood of discharge from the site entering Warrina Inlet is considered to be low and more likely to impact the down gradient public land and the adjacent golf course. Therefore, Robson considers AQUA/4(urban streams and stormwater) is the more appropriate the setting and has adopted these criteria as set out in the ACT *Environment Protection Regulation 2005*.

The Australian and New Zealand Environment and Conservation Council (ANZECC, 2000) '*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*' state that for physical and chemical stressor triggers, where a state or territory has established regional guideline trigger values, such as the VIEW and AQUA/4 criteria, those values should be used in preference to the default values provided in the ANZECC (2000) Guidelines. Based on the above it is proposed that the GILs to be adopted will be the lower of the following:

- VIEW and AQUA/4 (urban streams and stormwater) sourced from the ACT *Environment Protection Regulation 2005*;
- Assessment criteria for the protection of 95 % of species in freshwater aquatic ecosystems sourced from the ANZECC (2000) Guidelines.

It is noted that the ACTPLA Territory Plan (2009) '*Water Use and Catchment General Code*' does not include domestic water supply as a purpose for which water may be used in urban and conservation catchments. As such, GILs for the protection of human health have not been considered in this assessment.

A summary of the adopted GILs for the assessment of risk to ecological values are presented below in **Table J**.

Table J: Groundwater Investigation Levels

Contaminant	ANZECC (2000)[1] (µg/L)	ACT AQUA/4[2] (µg/L)	Adopted GIL (µg/L)
Asbestos[4]	NE	NE	NE
Organics			
TPH C_6-C_9	NE	NE	NE
TPH C_{10}-C_{40}	NE	NE	NE
Benzene	950	300	300
Toluene	ID	300	300
Ethylbenzene	ID	140	140
m-xylene	ID	NE	NE
o-xylene	350	NE	350
p-xylene	200	NE	200
Xylene	NE	NE	NE
Naphthalene	16	NE	16
Polychlorinated Biphenyls (PCB)			
Arochlor 1242	0.3	NE	0.3
Arochlor 1254	0.01	NE	0.01
Total PCB	NE	1	1
Organochlorine Pesticides (OCP)			
Aldrin	NI	0.01	0.01
Chlordane	0.03	NI	0.03
DDE	NE	0.14	0.14
DDT	0.006	0.001	0.001
Dieldrin	NI	0.002	0.002

Contaminant	ANZECC (2000)[1] (µg/L)	ACT AQUA/4[2] (µg/L)	Adopted GIL (µg/L)
Endosulfan	0.03	0.1	0.1
Endrin	0.01	0.0023	0.0023
Heptachlor	0.01	0.003	0.003
Lindane	0.2	0.003	0.003
Methoxychlor	NE	0.04	0.04
Mirex	NE	0.001	0.001
Metals			
Arsenic	NI	50	50
Cadmium	0.2	0.2	0.2
Chromium	1	2	2
Copper	1.4	2	2
Lead	3.4	1	1
Mercury	0.6	0.1	0.1
Nickel	11	25	25
Zinc	8	5	5
Polycyclic Aromatic Hydrocarbons (PAH)			
Total PAH	NE	3	3
Nutrients			
Ammonia	900	2,200[3]	2,200
Nitrite	NE	60	60
Phosphorous (total)	100	≤100[2]	≤100[2]
Physio-chemical parametres			
Acidity	8	6.5-9.0[2]	6.5-9.0[2]

Notes:

1. ANZECC (2000) '*Australian and New Zealand Guidelines for Fresh and Marine Water Quality*'. Trigger values for freshwater aquatic ecosystems, 95 % level of protection (% species)/Freshwater lakes and reservoirs (Physical and chemical stressors).
2. ACT *Environment Protection Regulation 2005* – AQUA/4 Urban Streams and Stormwater
3. The most sensitive value as calculated from the parameters of the current assessment.
4. Asbestos in water is not considered to be harmful to natural ecosystems therefore a guideline has not been established. Further, as the water on site is not used as a potable source the '*2004 Australian Drinking Water Guidelines*' (ADWG 2004) have not been considered. However, it should be noted that a guideline for asbestos in drinking water has not been established and the National Health and Medical Research Council (NHMRC) support this with a fact sheet that states "There is insufficient data to set a guideline value", "as the weight of evidence indicates that ingested asbestos is not hazardous to health". Also the World Health Organization (WHO) has concluded that establishing a guideline for asbestos in drinking-water is unnecessary, given the absence of evidence that the ingested asbestos is hazardous to health.

µg/L – Micrograms per litre
NE – Not established
ID – Insufficient data to derive a reliable trigger value.

Evaluation of Water Assessment Criteria

Envirolab Pty Ltd (Envirolab) is the proposed primary laboratory, while SGS Services Pty Ltd (SGS) is the proposed secondary laboratory. Both laboratories are NATA endorsed for the proposed analytical suite.

The limits of laboratory reporting (LOR) for the analytical methods used by the primary laboratory were compared with the proposed assessment criteria. This was to ensure that the assessment criteria values exceeded the laboratory LOR. The results of the comparison are presented below in **Table K.**

Table K: Comparison of Laboratory LOR with the Adopted GILs

Contaminant	Adopted GIL (µg/L)	Laboratory LOR[1] (µg/L)
Organics		
TPH C_6-C_9	NE	10
TPH C_{10}-C_{40}	NE	NA
Benzene	300	1
Toluene	300	1
Ethylbenzene	140	1
m-Xylene	NE	NA
o-Xylene	350	1
p-Xylene	200	NA

Contaminant	Adopted GIL (µg/L)	Laboratory LOR[1] (µg/L)
m&p-Xylene	NE	2
Xylene	NE	3[2]
Naphthalene	16	1
Polychlorinated Biphenyls		
Arochlor 1242	0.3	0.1
Arochlor 1254	0.01	**0.1**
Total PCB	1	0.1
Organochlorine Pesticides (OCP)		
Aldrin	0.01	0.01
Chlordane	0.03	0.01
DDE	0.14	0.01
DDT	0.001	**0.006**
Dieldrin	0.002	**0.01**
Endosulfan	0.1	0.01
Endrin	0.0023	**0.01**
Heptachlor	0.003	**0.01**
Lindane	0.003	NA
Methoxychlor	0.04	0.02
Mirex	0.001	NA
Metals		
Arsenic	50	1
Cadmium	0.2	0.1
Chromium	2	1
Copper	2	1

Contaminant	Adopted GIL (µg/L)	Laboratory LOR[1] (µg/L)
Lead	1	1
Mercury	0.1	0.05
Nickel	25	1
Zinc	5	1
Polycyclic Aromatic Hydrocarbons (PAH)		
Total PAH	3	2

Notes:

1. Only the LORs of the primary laboratory are considered.
2. Combined LORs of m&p–xylene and o–xylene.

BOLD – LOR exceeds the adopted GIL.
µg/L – Micrograms per litre
NA – Not analysed
NE – Not established

Based on the review the laboratory LOR a number of analytes, primarily in the PCB and OCP groups, exceed the adopted GILs. Considering, the site setting is not likely to discharge waters directly into adjacent receiving waters any analyte concentrations below the LOR is unlikely to have a significant impact on the environment. Therefore analysis to the standard LOR is considered appropriate for the purposes of this assessment.

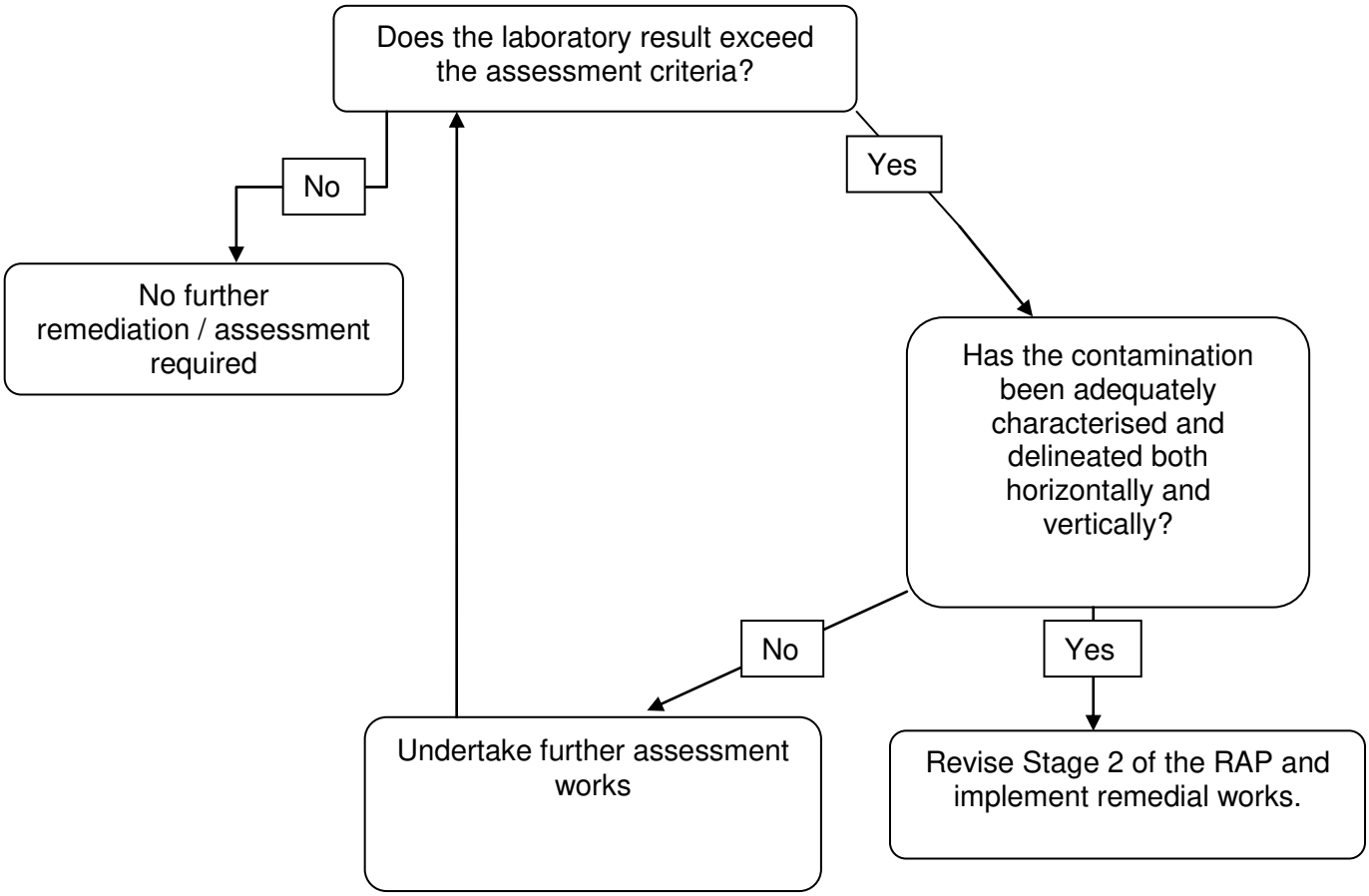
With regards to the laboratory not providing individual analytical results for either m-Xylene or p-Xylene, it was considered that the analysis which would be undertaken (m & p- Xylene) would be adequate as the LOR for this analysis is well below the criteria for either m-Xylene and p-Xylene.

4.5.5 Airborne Fibre Monitoring Criteria

The control level for airborne fibre concentrations recorded during air monitoring will be 0.01 fibres/mL, as required by National Occupational Health and Safety Commission (NOHSC): 2002 (2005) '*Safe Removal of Asbestos, 2nd Edition*'. It is further noted that 0.01 fibres/mL represents a concentration that is 1/10th of the WorkSafe Australia's recommended Exposure Standard for all forms of asbestos of 0.1 fibres/mL, as documented in the guideline NOHSC:1003 (1995, amended 2003) '*Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment*'.

4.6 Develop a Decision Rule

Should analytical results of soil samples indicate contaminant concentrations at levels which exceed the adopted assessment criteria, then the significance of the exceedences and appropriate course of actions would be assessed in liaison with the Site Auditor and then discussed within the ESA report. The decision rule for the comparison of laboratory results with the assessment criteria is presented in the following flow chart.



4.7 Specify Tolerable Limits on Decision Errors

Two (2) primary decision errors may occur which would affect the outcome of the assessment of the suitability of the site for the proposed land use. The errors and their associated consequences are presented in **Table L** below.

Table L: Identified Decision Errors and Associated Consequences for the Site

Error	Consequences
The site is assessed as suitable for the proposed residential use (HIL 'B') when it is actually unsuitable.	Contamination remains on site that may pose a risk to human health and / or the environment.
The site is assessed as unsuitable for the proposed residential use when the site is actually suitable.	Financial consequences associated with unnecessary assessment and / or remedial works.

The consequence of assessing the site as suitable when it is in fact unsuitable is considered to be more significant than the consequence of assessing the site as unsuitable.

Similar, there are also two (2) primary decision errors which may occur which would affect the outcome of the assessment of the suitability of the material proposed to be bulk excavated and beneficially re-used and / or disposed of off-site. The errors and their associated consequences are presented in **Table M** below.

Table M: Identified Decision Errors and Associated Consequences for Off-Site Beneficial Re-Use and / or Waste Disposal

Error	Consequences
The material in the dump is assessed as being suitable for BRU and / or disposal when it is actually unsuitable.	Contamination is transported to the recipient site and may pose a risk to human health and / or the environment.
The material to be bulk excavated (or part thereof) is assessed as being unsuitable for BRU and / or disposal when it is actually suitable.	Financial consequences associated with unnecessary remediation and associated management.

Factors that may contribute to the above decision errors include:

- Sampling design errors – may be attributed to too few sample locations, high variability of the contaminant dispersion or volatile loss due to the disturbed nature of the sample;
- Measurement errors – may be attributed to poor sampling methods, sample collection techniques, poor sample handling, poor sample preparation or analytical errors;
- Interpretive error – data is interpreted incorrectly.

The strategy to minimise the risk of a decision error from occurring is presented below in **Table N**.

Table N: Strategy for Minimising the Risk of a Decision Error from Occurring.

Factor Contributing to Error	Type of Error	Actions to Minimise Risk of Occurring
Sample Design Error	Insufficient Sampling	Validation sampling to be conducted in general accordance with the WA Guidelines and NSW EPA (1995) '*Sampling Design Guidelines*'.
	Contaminant Variability	Appropriate number of duplicate / triplicate samples to be collected in accordance with AS4482.1-2005.
Measurement Errors	Inappropriate Sample Methods	Selection of appropriate sample method to allow sampling of the required locations.
	Sample Collection Techniques	Sampling to be completed in accordance with Robson Standard Operating Procedures (SOP) '*Soil Sampling and Logging*' (EAR-SOP003).
	Volatile Loss	Soil samples will be immediately placed into clean laboratory supplied glass jars, sealed with teflon-lined lids and stored in an ice cooled container.
	Poor Sample Handling	Samples to be stored and transported in ice cooled eskies under Chain of Custody (COC) conditions.
	Poor sample preparation and analytical error	Field quality assurance / quality control (QA / QC) duplicates, triplicates, rinsates, trip blanks and trip spikes to be collected in accordance with AS4482.1-2005 to assess reproducibility of sample results, decontamination procedures and potential volatile loss during transport. Laboratory QA / QC to be reviewed to assess laboratory quality.
Misidentification of ACM	Incorrect identification of contaminant	A licensed ACT Class 'A' Asbestos Assessor will be responsible for providing clearance of the site to ensure that there is no visible ACM at the surface of the remedial excavations prior to the reinstatement of clean soil.

Factor Contributing to Error	Type of Error	Actions to Minimise Risk of Occurring
	Removal of uncontaminated material	A licensed ACT Class 'A' Asbestos Assessor will be present on site to assess that the material known to contain ACM is removed from the site.
Interpretive Error	Incorrect interpretation leading to error	All reports and correspondence to be peer reviewed within Robson and final report to be reviewed by third party NSW EPA accredited Site Auditor.

Duplicate samples will be used to assess the reproducibility of the sampling and analytical methods used. Calculation of the Relative Percentage Difference (RPD) is a method of normalising two (2) values, and allows a comparison between values and represents the difference between the primary and QC sample, divided by the average of the two results expressed as a percentage.

The RPD is calculated with the formula provided below.

$$RPD = \frac{\text{Result No. 1} - \text{Result No.2}}{\text{Mean Result}} \times 100$$

Calculated RPD results would be considered acceptable when the value is less than 50 %. Should the RPD value exceed 50 %, then further investigation to the cause of the difference between the primary and QC results would be undertaken.

The tolerances for the evaluation of the internal laboratory quality control samples are based on the laboratory's acceptance criteria. The tolerances for the laboratory quality control samples are summarised below in **Table O**.

Table O: Limits for the Assessment of Internal Laboratory Quality Control Samples.

Sample Type	Acceptable Limits
Surrogate Spikes	60% - 140%
Duplicate Sample	0% - 50% (if result is 5 times greater than the LOR)
Duplicate Sample	Any RPD is acceptable (if result is 5 times less than the LOR)
Matrix Spikes	70% - 130% (metals)
Method Blanks	Less than the LOR

Should the results of the internal laboratory QA / QC exceed the acceptable limits, then investigation of the laboratory methods would be undertaken to assess

whether the reliability of laboratory results is compromised and how the laboratory results may affect the decision making process outcomes of the assessment.

4.8 Optimise the Design for Obtaining Data

This assessment relates to the characterisation of the 'AD'. The following sections outline the proposed assessment and sampling strategy for the collection of information to assess the effectiveness of ESA.

4.9 Data Quality Indicators

Data quality indicators (DQI's) will be used to assess the performance in achieving the DQO's, and to assess whether the data obtained is reliable and useful for the assessment purposes. In summary, DQI's include the following:

- Accuracy – Accuracy is a quantitative measure of the closeness of a reported result against the true value;
- Precision – Precision is a quantitative measure of the reproducibility of a result;
- Representativeness – Representativeness is an expression of the confidence (expressed qualitatively) that data are representative of each media present on the site.
- Completeness – Completeness is a measure of the useable data from a sampling event;
- Comparability – Comparability is the confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event;

A summary of the proposed methods to be employed to ensure that the DQO's are met include the following:

<u>Data Accuracy and Precision</u>

- A suitably qualified and experienced Robson environmental scientist will undertake sampling and screening activities in accordance with Robson's SOPs. Where applicable, a licensed ACT Class 'A' asbestos assessor from Robson would also be utilised;
- The scientist / asbestos assessor will employ appropriate sampling methods to minimise the opportunities for cross-contamination to occur between samples;
- Laboratory analysis would be undertaken only at analytical laboratories NATA accredited for the analysis to be undertaken;
- The scientist / asbestos assessor will implement the field based QA/QC program through the collection of field based blind duplicates, by carrying field blanks with the daily samples and forwarding trip spikes with the samples to the lab.
- The analytical laboratory will employ their own internal quality control program which will include at least laboratory control samples, blanks, duplicates,

matrix spikes and surrogate spikes. The allowable tolerance for internal laboratory QA is provided in **Section 4.7**.

Data Comparability

- The Robson environmental scientist / asbestos assessor will be suitably qualified and experienced and employ appropriate sampling methods in accordance with the SOPs;
- The Robson environmental scientist/ asbestos assessor will record field conditions at the time of sampling and will ensure samples are taken in the same way specific to the media being sampled;
- Appropriate sample storage and transportation methods will be employed, including transportation under COC conditions;
- Laboratory analysis would be undertaken only at analytical laboratories NATA accredited for the analysis to be undertaken;
- Where possible, consistent analytical methods would be employed for laboratory analysis.

Data Completeness and Representativeness

- Implementation of appropriate sampling design, with appropriate sampling density and sampling depths;
- The media sampled and the analytes selected for analysis is in accordance with the SAQP;
- Preparation of field notes including daily sites activities register, logs, sample plans, COC sheets, field equipment calibration registers, PID screening register, field QA / QC sample register, photographic log register, site sketches and notes, sample registers, and soil tracking records;
- Confirmation that laboratories have received samples in good order (sample receipt acknowledgement);
- Ensuring that laboratory certificates received are signed by authorised signatories and bear the NATA stamp;
- Confirmation that the laboratories have analysed as per the COC request.

Appendix B

PID Calibration Records and Certificates

Field Calibration Register

Issued Date 5/11/13
Doc No: EAR-F005
Printed: 23/07/2014 2:25 PM

Electronic version current
Uncontrolled copy valid only at time of printing

Project Number and Name: 9623 - Soil Assessment
Client: Capezio and Co
Location: Yarrawunta Brickworks
Project Manager: BK
Field Personnel: AR
Date: 4/12/14
Work Description (ESA, TEA, GME): Testpitting

Photoionisation Detector (PID)

Equipment Serial/ID Number:
Equipment Description: mini RAE2000

Calibration and Service Details

Frequency required by manufacturer: Six monthly
Date last calibration (by qualified technician):
Calibrated by (personnel and company name):
Calibration (Fresh Air): 0ppm
Calibration (Span Gas - Isobutylene): 100ppm

Field Challenge Details

Date	Time	Zero-Fresh Air	Span-Isobutylene
4/12/14	10:10 am	0ppm	100ppm
9/12/14	8 Am	0ppm	100ppm
10/12/14	7:30 AM	0ppm	100ppm

Date	Time	Zero-Fresh Air	Span-Isobutylene
11/12/14	8 Am	0	100ppm

Water Quality Meter (WQM)

Equipment Serial/ID Number:
Equipment Description:

Calibration and Service Details

Frequency required by manufacturer:
Date last calibration (by qualified technician):
Calibrated by (personnel and company name):
Calibration standard / Comments:

Field Challenge Details

Date	Time	pH	EC (ms/cm)(µScm)	DO (%) (ppm)	Redox - ORP (mV)

Interface Probe (IP)

Equipment Serial/ID Number:
Equipment Description:

Maintenance Details

Frequency required by manufacturer:
Date last maintained (by qualified technician):
Maintained by (personnel and company name):
Comments:

Field Maintenance Details

Date	Time	Cleaning Method

Gas Monitor (CO_2, H_2S, LEL, O_2)

Equipment Serial/ID Number:
Equipment Description:

Calibration and Service Details

Frequency required by manufacturer:
Date last calibration (by qualified technician):
Calibrated by (personnel and company name):
Calibration standard / Comments:

Field Challenge Details

Date	Time	CO	H_2S	LEL	O_2

Appendix C

Asbestos Waste Disposal Dockets

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151
MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283712\1
Date: 9/12/2014 8:27 AM
Printed: 9/12/2014 8:27 AM
Operator: ISS3

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YIK11K
Carrier:
Order No:

S3-ASBESTOS Product Charges
15.96t @ $151.70/t $2421.13

Subtotal $2421.13
Rounding $0.00
Total including GST $2421.13
GST $220.10

Gross 27.40t
Tare 11.44t

Net 15.96t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283614\1
Date: 8/12/2014 3:09 PM
Printed: 8/12/2014 3:09 PM
Operator: ISS7

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YIK11K
Carrier:
Order No:

S3-ASBESTOS Product Charges
18.98t @ $151.70/t $2879.27

Subtotal $2879.27
Rounding $0.00
Total including GST $2879.27
GST $261.75

Gross 30.32t
Tare 11.34t

Net 18.98t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283756\1
Date: 9/12/2014 11:02 AM
Printed: 9/12/2014 11:02 AM
Operator: ISS3

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YIK11K
Carrier:
Order No:

S3-ASBESTOS Product Charges
14.06t @ $151.70/t $2132.96

Subtotal $2132.90
Rounding $0.00
Total including GST $2132.90
GST $193.90

Gross 25.48t
Tare 11.42t

Net 14.06t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283767\1
Date: 9/12/2014 11:26 AM
Printed: 9/12/2014 11:26 AM
Operator: IS83

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS Product Charges	
18.68t @ $151.70/t	$2864.10
Subtotal	$2864.10
Rounding	$0.00
Total including GST	$2864.10
GST	$260.37

Gross 30.40t
Tare 11.52t
Net 18.68t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283737\1
Date: 9/12/2014 10:08 AM
Printed: 9/12/2014 10:09 AM
Operator: IS83

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS Product Charges	
16.52t @ $151.70/t	$2506.08
Subtotal	$2506.08
Rounding	$0.00
Total including GST	$2506.08
GST	$227.83

Gross 28.06t
Tare 11.54t
Net 16.52t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283715\1
Date: 9/12/2014 8:37 AM
Printed: 9/12/2014 8:37 AM
Operator: IS83

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS Product Charges	
15.74t @ $151.70/t	$2387.76
Subtotal	$2387.76
Rounding	$0.00
Total including GST	$2387.76
GST	$217.07

Gross 27.30t
Tare 11.56t
Net 15.74t

Mugga Lane
ACT NOW/STE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MW283609\1
Date: 8/12/2014 3:05 PM
Printed: 8/12/2014 3:06 PM
Operator: ISS7

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 33108729737
Address: 40 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS Product Charges
19.66t @ $151.70/t $2982.42

Subtotal $2982.42
Rounding $0.00
Total including GST $2982.42
GST $271.13

Gross 31.14t
Tare 11.48t
Net 19.66t

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irwin&Hartshorn pty ltd
abn 69 074 330 082

12 alderson place
hume act 2620

phone 02 6260 1588
fax 02 6260 1236

demolitionexcavationplanthirebulkhaulage
generalhaulageheavyhaulagetilttrayhireoverdimensiontransport

Customer: AAC (Brad Archer)

Date: 8/12/14
Driver: STORK
Rego No. YHY70F

Job Description:

	$	¢
Asbestos 1283573	17.6	
MW 02816 M\1	13.22	
MW 02853 M\1	17.98	
* MWI 283609	14.66	

From: Yarralumla Brick Works

To: Mugga Asbestos P.t

Start Time: 0730 AM / PM (INC. TRAVEL)
Finish Time: 1530 AM / PM (INC. TRAVEL)
Total: .....

Docket No. 36463
IH/MP 004 10-07

Total

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN [illegible]

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI283558\1
[illegible]
Printed: 9/12/2014 9:48 AM
[illegible]

[illegible]
Customer ABN: [illegible]
Address: 10 A RAILWAY STREET
[illegible]: OAKS ESTATE
[illegible]
Vehicle: YIK13Y
[illegible]
[illegible]

[illegible] Product Charges
[illegible] $2336.18

Subtotal $2336.18
Rounding $0.00
Total including GST $2336.18
[illegible] $212.38

Gross 24.80t
Tare 11.38t
Net 15.40t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN [illegible]

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET Manual

Docket: MWQ2778M\1
[illegible]: 9/12/2014 10:46 AM
[illegible]: 9/12/2014 10:41 AM
Operator: [illegible]

Customer: AAC ENVIRONMENTAL PTY LTD
[illegible] ABN: [illegible]
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
[illegible]
[illegible]

[illegible] Product Charges
[illegible] $2669.92

Subtotal $2669.92
[illegible] $0.00
Total including GST $2669.92
[illegible] $242.72

Gross 29.10t
Tare 11.50t
Net 17.60t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN [illegible]

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

[illegible]

[illegible] MW02790M\1

[illegible]

[illegible]

[illegible]

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MW0283OM\1

Customer: PPC ENVIRONMENTAL PTY LT
Customer ABN:
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE

Vehicle:

Order No:

01-ACCEPTS	Gate Charge	$2069.19
Subtotal		$2069.19
Rounding		$0.00
Total including GST		$2069.19
GST		$188.11

Gross 25.02t
Tare 11.38t

Net 13.64t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MW0285OM\1
Date: 8/12/2014
Printed: 8/12/2014
Operator:

Customer: PPC ENVIRONMENTAL PTY LT
Customer ABN:
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle:
Carrier:
Order No:

02-ACCEPTS	Product Charge	
17.98t @ $151.70/t		$2727.57
Subtotal		$2727.57
Rounding		$0.00
Total including GST		$2727.57
GST		$247.96

Gross 29.46t
Tare 11.48t

Net 17.98t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN [illegible]

MUGGA LANE
SYMONSTON ACT 260[illegible]

DELIVERY DOCKET

Docket: MW02859M\1
Date: [illegible]
Operator: [illegible]

Customer: [illegible]
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Vehicle: [illegible]
Order No:

18.72t @ $151.70/t	$2839.82
Subtotal	$2839.82
Rounding	$0.00
Total including GST	$2839.82

Gross	30.04t
Tare	11.32t
Net	18.72t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI282680\1
Date: 2/12/2014 9:49 AM
Printed: 2/12/2014 9:49 AM
Operator: ISS7

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS	Product Charges	
15.84t @ $151.70/t		$2402.93
Subtotal		$2402.93
Rounding		$0.00
Total including GST		$2402.93
GST		$218.45

Gross	27.36t
Tare	11.52t
Net	15.84t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI282709\1
Date: 2/12/2014 11:10 AM
Printed: 2/12/2014 11:10 AM
Operator: ISS7

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS	Product Charges	
16.90t @ $151.70/t		$2563.73
Subtotal		$2563.73
Rounding		$0.00
Total including GST		$2563.73
GST		$233.07

Gross	28.40t
Tare	11.50t
Net	16.90t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

DELIVERY DOCKET

Docket: MWI282758\1
Date: 2/12/2014 12:34 PM
Printed: 2/12/2014 12:34 PM
Operator: ISS7

Customer: AAC ENVIRONMENTAL PTY LT
Customer ABN: 83108729737
Address: 10 A RAILWAY STREET
Suburb: OAKS ESTATE
Destination:
Vehicle: YHY70F
Carrier:
Order No:

S3-ASBESTOS	Product Charges	
14.34t @ $151.70/t		$2175.38
Subtotal		$2175.38
Rounding		$0.00
Total including GST		$2175.38
GST		$197.76

Gross	25.84t
Tare	11.50t
Net	14.34t

ACT TOWARTE MUSGA LANE

MUSGA LANE
EYMONGTON ACT 2611

DELIVERY DOCKET

Total including GST $837.39

Gross 19.14t
Tare 4.34t

Net 5.52t

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

TAX INVOICE

Docket: MWI282486\1
Date: 1/12/2014 11:43 AM
Printed: 1/12/2014 11:44 AM
Operator: ISS1

Customer: Cash Customers
Vehicle: YKD603

S3-ASBESTOS Product Charges
4.32t @ $151.70/t $655.34

Subtotal $655.34
Rounding $0.00
Total including GST $655.34
GST $59.58

Gross 9.00t
Tare 4.68t
Net 4.32t

Payment/Refund $655.34
Paid By Credit Card
Ref No 266288031198

Detail 1:
Detail 2:
Detail 3:

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

TAX INVOICE

Docket: MWI282447\1
Date: 1/12/2014 9:33 AM
Printed: 1/12/2014 9:34 AM
Operator: ISS1

Customer: Cash Customers
Vehicle: YKD603

S3-ASBESTOS Product Charges
4.98t @ $151.70/t $755.47

Subtotal $755.47
Rounding $0.00
Total including GST $755.47
GST $68.68

Gross 9.66t
Tare 4.68t
Net 4.98t

Payment/Refund $755.47
Paid By Credit Card
Ref No 266288031107

Detail 1:
Detail 2:
Detail 3:

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

TAX INVOICE

Docket: MWI282194\1
Date: 28/11/2014 2:02 PM
Printed: 28/11/2014 2:03 PM
Operator: ISSC

Customer: Cash Customers
Vehicle: YK0603

53-ASBESTOS Product Charges
5.74t @ $151.70/t $870.76

Subtotal $870.76
Rounding $0.00
Total including GST $870.76
GST $77.16

Gross 10.40t
Tare 4.66t
Net 5.74t

Payment/Refund $870.76
Paid By Credit Card
Ref No 266286029973

Detail 1:
Detail 2:
Detail 3:

Mugga Lane
ACT NOWASTE MUGGA LANE
ABN 52 427 642 151

MUGGA LANE
SYMONSTON ACT 2609

TAX INVOICE

Docket: MWI282158\1
Date: 28/11/2014 12:27 PM
Printed: 28/11/2014 12:28 PM
Operator: ISSC

Customer: Cash Customers
Vehicle: YK0603

53-ASBESTOS Product Charges
4.48t @ $151.70/t $679.62

Subtotal $679.62
Rounding $0.00
Total including GST $679.62
GST $61.78

Gross 9.22t
Tare 4.74t
Net 4.48t

Payment/Refund $679.62
Paid By Credit Card
Ref No 266286029961

Detail 1:
Detail 2:
Detail 3:

Pd $6400. 13/1/15
$5000. 2/1/15
$5000. 2/1/15
$10000. 15/1/15
$10,000. 16/1/15 JPX8LC
$5,000 16/1/15 FHGRCV
5605.27 16/1/15

ACT Government
Territory and Municipal Services

Tax Invoice

ABN: 52 427 642 151

Invoice To	Details
AAC ENVIRONMENTAL PTY LTD (LANDFILL & RECYCLING) 17 Capital Terrace QUEANBEYAN NSW 2620	**Customer Number:** 144758 **Invoice Number:** NWT014051 **Invoice Date:** 18-DEC-2014 **Payment Terms:** 30 DAYS NET **Due Date:** 17-JAN-2015 **Amount Payable:** **$47,005.77**

Line	Description	Qty	Unit	Unit Price	Total exc GST	GST	Total inc GST
001	2/12/2014 MWI282663\\1 YKO603 S3-ASBESTOS 5.18t	1		$785.81	$714.37	$71.44	785.81
002	2/12/2014 MWI282680\\1 YHY70F S3-ASBESTOS 15.84t	1		$2,402.93	$2,184.48	$218.45	2,402.93
003	2/12/2014 MWI282709\\1 YHY70F S3-ASBESTOS 16.9t	1		$2,563.73	$2,330.66	$233.07	2,563.73
004	2/12/2014 MWI282728\\1 YKO603 S3-ASBESTOS 5.52t	1		$837.38	$761.25	$76.13	837.38
005	2/12/2014 MWI282758\\1 YHY70F S3-ASBESTOS 14.34t	1		$2,175.38	$1,977.62	$197.76	2,175.38
	total 57.78t						
006	3/12/2014 MWI282903\\1 YKO603 S3-ASBESTOS 1t	1		$151.70	$137.91	$13.79	151.70
007	8/12/2014 MWI283558\\1 YIK11K S3-ASBESTOS 15.4t	1		$2,336.18	$2,123.80	$212.38	2,336.18
008	8/12/2014 MWI283609\\1 YHY70F S3-ASBESTOS 19.66t	1		$2,982.42	$2,711.29	$271.13	2,982.42
009	8/12/2014 MWI283614\\1 YIK11K S3-ASBESTOS 18.98t	1		$2,879.27	$2,617.52	$261.75	2,879.27
010	8/12/2014 MWO2778M\\1 YHY70F S3-ASBESTOS 17.6t	1		$2,669.92	$2,427.20	$242.72	2,669.92
011	8/12/2014 MWO2790M\\1 YIK11K S3-ASBESTOS 18.54t	1		$2,812.52	$2,556.84	$255.68	2,812.52
				Invoice Totals:	$42,732.50	$4,273.27	$47,005.77

ACT NOWASTE AR

Payment enquiries should be directed to: NOWaste Accounts Receivable 132281

EFT payments can be made to:

BSB Number: 037-843

Account Number: 540144758

Reference: NWT014051

Account Name: ACT Government Account

Please return this section with your payment to:

Shared Services Accounts Receivable
GPO BOX 158
CANBERRA CITY ACT 2601

Fax: (02) 620 53202
Email: SharedServicesAccountsReceivable@act.gov.au

Customer Number: 144758
Invoice Number: NWT014051
Invoice Date: 18-DEC-2014
Due Date: 17-JAN-2015
Amount Payable: **$47,005.77**
No receipt mailed unless requested

ACT Government
Territory and Municipal Services

Tax Invoice

ABN: 52 427 642 151

Invoice To	Details
AAC ENVIRONMENTAL PTY LTD (LANDFILL & RECYCLING) 17 Capital Terrace QUEANBEYAN NSW 2620	**Customer Number:** 144758 **Invoice Number:** NWT014051 **Invoice Date:** 18-DEC-2014 **Payment Terms:** 30 DAYS NET **Due Date:** 17-JAN-2015 **Amount Payable:** **$47,005.77**

Line	Description	Qty	Unit	Unit Price	Total exc GST	GST	Total inc GST
012	8/12/2014 MWO2816M\\1 YHY70F S3-ASBESTOS 13.22t	1		$2,005.47	$1,823.15	$182.32	2,005.47
013	9/12/2014 MWI283756\\1 YIK11K S3-ASBESTOS 14.06t	1		$2,132.90	$1,939.00	$193.90	2,132.90
014	8/12/2014 MWO2830M\\1 YIK11K S3-ASBESTOS 13.64t	1		$2,069.19	$1,881.08	$188.11	2,069.19
015	8/12/2014 MWO2853M\\1 YHY70F S3-ASBESTOS 17.98t	1		$2,727.57	$2,479.61	$247.96	2,727.57
016	9/12/2014 MWI283767\\1 YHY70F S3-ASBESTOS 18.88t	1		$2,864.10	$2,603.73	$260.37	2,864.10
017	8/12/2014 MWO2859M\\1 YIK11K S3-ASBESTOS 18.72t	1		$2,839.82	$2,581.65	$258.17	2,839.82
018	9/12/2014 MWI283712\\1 YIK11K S3-ASBESTOS 15.96t	1		$2,421.13	$2,201.03	$220.10	2,421.13
019	9/12/2014 MWI283715\\1 YHY70F S3-ASBESTOS 15.74t	1		$2,387.76	$2,170.69	$217.07	2,387.76
020	9/12/2014 MWI283734\\1 YIK11K S3-ASBESTOS 16.18t	1		$2,454.51	$2,231.37	$223.14	2,454.51
021	9/12/2014 MWI283737\\1 YHY70F S3-ASBESTOS 16.52t	1		$2,506.08	$2,278.25	$227.83	2,506.08
	3rd of Dec: 1 tow 2nd of Dec 57.78t 8th of Dec: 153.74t 9th of Dec: 97.34t						
ACT NOWASTE AR				**Invoice Totals:**	$42,732.50	$4,273.27	$47,005.77

Payment enquiries should be directed to: NOWaste Accounts Receivable 132281

EFT payments can be made to:

BSB Number: 037-843

Account Number: 540144758

Reference: NWT014051

Account Name: ACT Government Account

Please return this section with your payment to:

Shared Services Accounts Receivable
GPO BOX 158
CANBERRA CITY ACT 2601

Customer Number: 144758
Invoice Number: NWT014051
Invoice Date: 18-DEC-2014
Due Date: 17-JAN-2015
Amount Payable: **$47,005.77**
No receipt mailed unless requested

Fax: (02) 620 53202
Email: SharedServicesAccountsReceivable@act.gov.au

Appendix D

Site Photographs



Photograph 1: Site entry prior to the commencement of works – view to the west – 14/11/2014



Photograph 2: View of site compound to the northeast – 14/11/2014



Photograph 3: View of built entry to the site – 21/11/2014



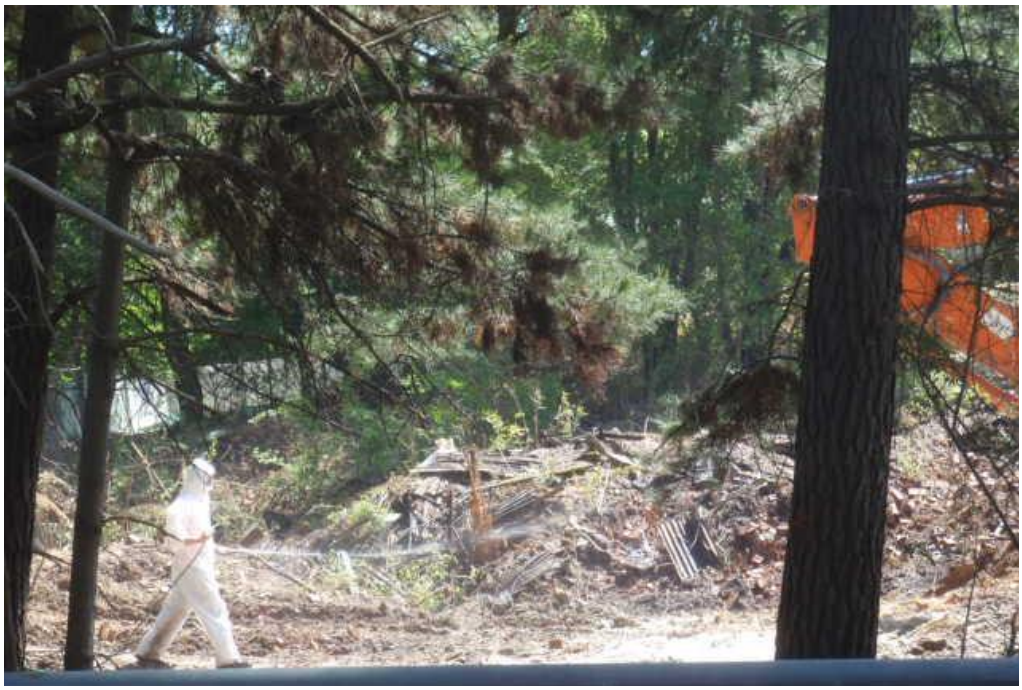
Photograph 4: Removal of blackberry vine with Bobcat – 21/11/2014



Photograph 5: AAC undertaking vegetation removal (view to the north from site compound) – 24/11/2014



Photograph 6: View of exposed ACM following vegetation removal – 28/11/2014



Photograph 7: View of ACM removal – 2/12/2014



Photograph 8: Vegetation removal – 1/12/2014



Photograph 9: View of ACM finds following vegetation removal – 1/12/2014



Photograph 10: Loading surface ACM – 28/11/2014



Photograph 11: Covered ACM load for transport to MLRMC – 28/11/2014



Photograph 12: Loading ACM (final day of ACM removal) – 8/12/2014



Photograph 12: View of Decontamination Unit - 5/12/2014



Photograph 14: View of TP22 with brick and glass fragments (no ACM observed) – 4/12/2014



Photograph 15: View of TP23 with fill (brick and ash/ slag fragments) – no ACM observed) - 4/12/14



Photograph 16: View of TP25 with natural soil (no fill observed – surface sample only) - 4/12/14



Photograph 17: View of TP1 with fill (brick and tile) – no ACM observed) - 9/12/14



Photograph 18: View of TP3 with fill (brick and tile) – ACM observed on surface) - 9/12/14



Photograph 19: View of TP2 with natural soil at the base – no ACM observed) - 9/12/14



Photograph 20: View of TP11 with natural soil at the base – no ACM observed) - 10/12/14



Photograph 21: View of TP8 with fill (brick, metal, wood surface ACM) – 10/12/14



Photograph 22: View of TP8 with water and possibly natural soil its base - 10/12/14



Photograph 23: View of TP10 with fill (No ACM observed) – 11/12/2014



Photograph 24: View of TP10 with fill (brick and tile) – 12/12/2014



Photograph 25: View of TP10 with water (perched seepage water and not the water table) – 11/12/2014



Photograph 26: View of TP13 with fill (brick, plastic metal and ACM) – 11/12/2014



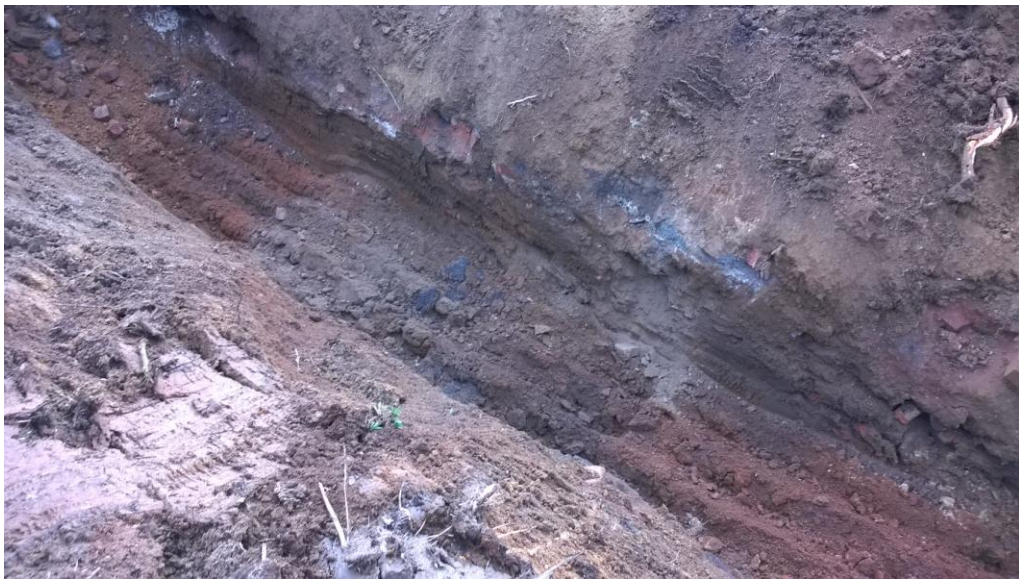
Photograph 27: View of TP16 with minor surface fill – 11/12/2014



Photograph 28: View of TP18 with no fill observed – 11/12/2014



Photograph 29: Trench 1 with view of natural soil in the profile at the south end – 12/12/2014



Photograph 30: Trench 1 with view of brick, ash and slag in the profile – 12/12/2014



Photograph 31: Trench 1 with view of high brick concentration on the north side of the drainage channel – 12/12/2014



Photograph 32: Trench 1 view to the south – 12/12/2014



Photograph 33: Trench 2 - View of natural soil intermixed with fill (no ACM observed) – 12/12/2014



Photograph 34: Trench 2 - View of fill between TP 6 and TP 7 (no ACM observed) – 12/12/2014



Photograph 35: Trench 2 - View of fill between TP 7 and TP8; note pocket of as and brick at base on trench (no ACM observed)– 12/12/2014



Photograph 36: Trench 2 - View of fill between near TP8 with Septic on the right (no ACM observed) – 12/12/2014



Photograph 37: Trench 2 between TP 9 and TP10 – 12/12/2014.



Photograph 38: Trench 2 – View to the north (no ACM observed except on the surface) – 12/12/2014.



Photograph 39: Trench 3 - View from the south end near TP11 and TP12 (no (ACM observed) – 12/12/2014



Photograph 40: Trench 3 - View to the north between TP12 and TP13 (ACM observed in fill) – 12/12/2014



Photograph 41: Trench 3 – North of TP13 (high ACM observed in fill) – 12/12/2014



Photograph 42: Trench 4 – with a view of ash at the south end (no ACM observed) - 12/12/2014



Photograph 43. View to the north of the TP13 Area following the test pit and trenching assessment works – 12/12/2014.



Photograph 44. View to the east from the TP13 Area following the test pit and trenching assessment works with mixed demo waste in the foreground – 12/12/2014.



Photograph 45. View to the north of mulching the stockpiled vegetation – 15/12/2014.



Photograph 46. View of site sealing activity with a bituminous sealant in the southwest corner of the site – 17/12/2014.



Photograph 47. View to the south following mulching and sealing activities – 18/12/2014.



Photograph 48. View to the north following mulching and sealing activities – 18/12/2014.

Appendix E

Test Pit Logs (1 - 25)

TEST PIT NUMBER TP1

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 9/12/14 **COMPLETED** 9/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Silty SAND, brown, medium to fine grained, minor gravel, igneous and shale.	PID: 0.0 PPM	Brick fragments, grass, and rootlets.
			0.5				PID: 0.0 PPM 0 PPM	Ash, and slag, up to 80% brick.
			1.0				PID: 0.0 PPM 0 PPM	
			1.5					
			2.0		FILL	FILL: Up to 100% brick and tile.		Up to 100% brick.
			2.5					
			3.0					
			3.5			Borehole TP1 terminated at 3.2m		
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP2

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 9/12/14 **COMPLETED** 9/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Gravelly, Clayey, SAND, brown, medium to fine grained, medium plasticity. Igneous rock fragments.		Bricks and brick fragments.
					FILL	FILL: Gravelly, Clayey, SAND, brown, medium to fine grained, medium plasticity.	PID: 0.0 PPM	Ash, and slag, up to 50% brick.
			0.5				PID: 0.0 PPM	
			1.0				PID: 0.0 PPM	
								Metal fragments.
			1.5					
			2.0				PID: 0.0 PPM	Glass fragments
			2.5					
					CL	Natural: Sandy CLAY, orange-red with yellow and grey mottling, medium to fine grained, medium plasticity.		
			3.0				PID: 0.0 PPM	
						Borehole TP2 terminated at 3.2m		
			3.5					
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP3

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 9/12/14 **COMPLETED** 9/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Sandy CLAY, orange to brown, medium plasticity, with rootlets.	PID: 0.7 PPM	Glass, brick, ACM.
			0.5				PID: 1.2 PPM 0 PPM	
					FILL	FILL: Sandy CLAY, medium plasticity, orange-brown to yellow, granite gravel and cobbles.		Upto 50% brick.
			1.0				PID: 0.0 PPM 0 PPM	
					SC	Natural: Clayey SAND, orange-red, fine to medium grained, medium plasticity.		
			1.5				PID: 0.0 PPM	
						Borehole TP3 terminated at 1.5m		
			2.0					
			2.5					
			3.0					
			3.5					
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP4

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Silty SAND, brown, fine to medium grained, minor granite gravel.	PID: 0.0 PPM	
			0.5				PID: 0.0 PPM	
			1.0				PID: 0.0 PPM	Brick fragments, ash and slag.
			1.5					
			2.0				PID: 0.0 PPM	
					FILL	FILL: Sandy CLAY, brown-red, medium to fine grained, medium plasticity,		
			2.5					
			3.0				PID: 0.0 PPM	
					CL	NATURAL: Sandy CLAY, orange-red, granite pebbles.		
			3.5				PID: 0.0 PPM	
						Borehole TP4 terminated at 3.7m		
			4.0					
			4.5					

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

TEST PIT NUMBER TP5

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 9/12/14 **COMPLETED** 9/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Silty SAND, brown, fine to medium grained.	PID: 0.0 PPM	Grass, root fibres, tree roots.
								Brick, glass, plastic, metal, organic matter, ash and slag.
			0.5				PID: 0.0 PPM	
			1.0					1 ACM fragment observed.
							PID: 0.0 PPM	
			1.5					
			2.0				PID: 0.0 PPM	
			2.5					
			3.0					
			3.5				PID: 0.0 PPM	
			4.0		CL	NATURAL: Sandy CLAY, orange-red, grey mottling, fine to medium grained, medium plasticity.		

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

TEST PIT NUMBER TP5

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 9/12/14 **COMPLETED** 9/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E							PID: 0.0 PPM	
						Borehole TP5 terminated at 4.2m		
			4.5					
			5.0					
			5.5					
			6.0					
			6.5					
			7.0					
			7.5					
			8.0					

TEST PIT NUMBER TP6

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Sandy CLAY, brown, some gravel.	PID: 0.0 PPM	
			0.5				PID: 0.0 PPM	Brick, metal, fibreglass sheeting, concrete fragments.
			1.0				PID: 0.0 PPM	ACM.
			1.5					
			2.0				PID: 0.0 PPM	
			2.5					
			3.0				PID: 0.0 PPM	
					FILL	FILL: Sandy CLAY, brown-yellow, mediumt o fine grained, some gravel.		
			3.5		GR	NATURAL: Highly weathered granite, yellow, very hard.	PID: 0.0 PPM	
			4.0			Borehole TP6 terminated at 3.5m		

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP7

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Silty, SAND, brown, medium to fine grained.	PID: 0.0 PPM	
			0.5				PID: 0.0 PPM	Some brick and metal.
			1.0				PID: 0.0 PPM	
			1.5					
			2.0				PID: 0.0 PPM	Plastic pipe.
			2.5					
			3.0				PID: 0.0 PPM	
			3.5					Increase of brick upto 25%
					FILL	FILL: Sandy CLAY, dark brown, medium plasticity, fine grained.		Increased moisture.
			4.0				PID: 0.0 PPM	

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TEST PIT NUMBER TP7

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

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DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			4.5		FILL	FILL: Sandy CLAY, dark brown, medium plasticity, fine grained. *(continued)*		
				+ + + + + +	GR	NATURAL: Weathered Granite, yellow, hard, medium grained.	PID: 0.0 PPM	
			5.0			Borehole TP7 terminated at 4.9m		
			5.5					
			6.0					
			6.5					
			7.0					
			7.5					
			8.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP8

Robson Environmental Pty Ltd
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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Sandy CLAY, brown, moderate plasticity.	PID: 0.0	Brick, metal, ACM, wood.
			0.5				PID: 0.0	
								Up to 80% brick.
			1.0				PID: 0.0	
			1.5					
			2.0				PID: 0.0	
			2.5		SC	NATURAL: Clayey SAND, grey-green-yellow, medium-coarse grained, some gravel.	PID: 0.0	
			3.0			Borehole TP8 terminated at 2.9m		
			3.5					
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP9

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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Sandy CLAY, brown, medium plasticity, medium-fine grained.	PID: 0.0	Ash, charcoal, brick fragments, slag.
			0.5		FILL	FILL: Clayey SAND, brown, medium-fine grained, medium plasticity.	PID: 0.0	
			1.0				PID: 0.0	
			1.5					
			2.0				PID: 0.0	
			2.5		FILL	FILL: Sandy CLAY, red-orange medium plasticity, some gravel.		
			3.0		FILL	FILL: Gravelly SAND, dark grey-brown, gravelly sand, coarse grained.	PID: 0.0	Increase of Brick at 2.5 upto 50%
			3.5		CL	NATURAL: Sandy CLAY, orange-red, grey mottling, fine to medium grained, medium plasticity.		
			4.0				PID: 0.0	

Borehole TP9 terminated at 4m

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

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TEST PIT NUMBER TP10

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** _____ **DATUM** _____

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** _____

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES _____

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Gravelly, Sandy, CLAY, red-brown, medium plasticity.	PID: 0.0	Slag, brick, organic matter, roots grass.
			0.5		FILL	FILL: Silty SAND, grey, fine to medium grained, minor gravel.	PID: 0.0	Slag, brick, tiles, ash.
			1.0				PID: 0.0	
			1.5					
			2.0				PID: 0.0	
			2.5					
			3.0				PID: 0.0	
			3.5					Upto 90% brick.
			4.0				PID: 0.0	

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

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TEST PIT NUMBER TP10

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			4.5		FILL	FILL: Silty SAND, grey, fine to medium grained, minor gravel. *(continued)*		Water Inflow.
			5.0		SHALE	Possible Natural: Shale Bedrock. Borehole TP10 terminated at 5.2m		
			5.5					
			6.0					
			6.5					
			7.0					
			7.5					
			8.0					

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TEST PIT NUMBER TP11

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					FILL	FILL: Silty SAND, brown, medium-fine grained, minor gravel, organic matter, roots, pine needles.	PID: 1.0 PPM	Brick, ash, slag/
					CL	NATURAL: Sandy CLAY, red-brown, medium plasticity, with silt stone cobbles.		
			0.5				PID: 0.1 PPM	
						Borehole TP11 terminated at 0.5m		
			1.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP12

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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					FILL	FILL: Silty, Sandy, CLAY, brown, medium-fine grained, ironstone gravel, roots.	PID: 0.0 PPM	Brick
					CL	NATURAL: Sandy CLAY, red-orange, medium plasticity, coarse-fine grained sand, and large cobbles of heavily weathered granite.		
			0.5				PID: 0.0 PPM	
						Borehole TP12 terminated at 0.5m		
			1.0					

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TEST PIT NUMBER TP13

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** ___ **DATUM** ___

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ___

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ___

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Sandy CLAY, brown, medium plasticity, minor siltstone gravel and cobbles.	PID: 0.0 PPM	Brick, plastic, metal, 20% ACM.
			0.5				PID: 0.0 PPM	Decrease of ACM at 0.5
					FILL	FILL: Silty SAND, brown, medium to fine grained.		Glass, metal, brick, concrete fragments, ash, and slag.
			1.0				PID: 0.0 PPM	
			1.5					
			2.0				PID: 0.0 PPM	Upto 50% glass, metal, brick concrete fragments, ash and slag.
			2.5					
			3.0				PID: 0.0 PPM	
					CL	NATURAL: Sandy CLAY, yellow-orange mottled, medium plasticity, with ironstone gravel.		
			3.5				PID: 0.0 PPM	
						Borehole TP13 terminated at 3.6m		
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

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TEST PIT NUMBER TP14

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Silty CLAY, red-brown, medium plasticity, with siltstone cobbles and gravel.	PID: 0.0 PPM	Organic matter, brick, concrete fragments, and tile.
			0.5				PID: 0.0 PPM	
					FILL	FILL: Silty Clayey SAND, red-brown, medium grained.		
			1.0				PID: 0.0 PPM	Brick, concrete fragments, ash and slag.
			1.5					
			2.0				PID: 0.0 PPM	
			2.5					
			3.0				PID: 0.0 PPM	
								Increase in ash and slag.
			3.5					
			4.0					

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TEST PIT NUMBER TP14

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			4.5		FILL	FILL: Silty Clayey SAND, red-brown, medium grained. *(continued)*	PID: 0.0 PPM	
			5.0					
			5.5				PID: 0.0 PPM	
						Borehole TP14 terminated at 5.5m		
			6.0					
			6.5					
			7.0					
			7.5					
			8.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP15

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PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 10/12/14 **COMPLETED** 10/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					FILL	FILL: Silty Sandy CLAY, brown, medium plasticity, siltstone fragments	PID: 0.0 PPM	Charcoal, roots.
			0.5		CL	NATURAL: Gravelly CLAY, orange-grey mottled, cobbles of weathered granite.	PID: 1.5 PPM	
			1.0				PID: 0.0 PPM	
						Borehole TP15 terminated at 1m		
			1.5					

TEST PIT NUMBER TP16

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140 Gladstone Street
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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					FILL	FILL: Silty Sandy CLAY, brown, medium plasticity. with minor organic matter, and ironstone accretions.	PID: 0.6 PPM	
			0.5		CL	NATURAL: Sandy CLAY, red-orange, medium plasticity, quartz gravel and granite cobbles.		
			1.0			Borehole TP16 terminated at 0.7m		
			1.5					

TEST PIT NUMBER TP17

Robson Environmental Pty Ltd
140 Gladstone Street
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PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Silty Sandy CLAY, medium plasticity, quartz gravel and cobbles, siltstone cobbles, with minor organic matter.	PID: 0.0 PPM	Charcoal, and brick fragments.
					FILL	FILL: Clayey SAND, yellow, weathered granite cobbles.		
			0.5				PID: 0.0 PPM	
			1.0				PID: 0.0 PPM	
					FILL	FILL: Sandy CLAY, bark brown, medium plasticity.		
			1.5					
			2.0				PID: 0.0 PPM	
			2.5		CL	NATURAL: Sandy CLAY, red-orange mottled, high plasticity.		
			3.0				PID: 0.0 PPM	
						Borehole TP17 terminated at 3m		
			3.5					
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP18

Robson Environmental Pty Ltd
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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					Topsoil	Silty Sandy CLAY, medium plasticity, with roots and rootlets.	PID: 0.0 PPM	
					CL	NATURAL: Sandy CLAY, red-orange, quartz gravel, weathered granite cobbles.		Very Hard
			0.5				PID: 1.0 PPM	
						Borehole TP18 terminated at 0.7m		
			1.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP19

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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 11/12/14 **COMPLETED** 11/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AM **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					FILL	FILL: Silty Sandy CLAY, brown, medium plasticity, with organic matter and roots.	PID: 0.2 PPM	Roots.
					FILL	FILL: Silty CLAY, yellow, medium plasticity.		
					CL	NATURAL: Sandy CLAY, red-orange, medium plasticity, medium plasticity.		
			0.5				PID: 0.0 PPM	
						Borehole TP19 terminated at 0.5m		
			1.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP20

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CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 4/12/14 **COMPLETED** 4/12/14 **R.L. SURFACE** _____ **DATUM** _____

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** _____

TEST PIT SIZE 3m by 1m **LOGGED BY** AR **CHECKED BY** BK

NOTES _____

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					Topsoil	Silty Clayey SAND, brown, fine grained, with roots, rootlets and organic matter.	PID: 3.1 PPM	
					SC	NATURAL: Clayey SAND, yellow-orange, medium grained.		
			0.5				PID: 1.6 PPM	
						Borehole TP20 terminated at 0.6m		
			1.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP21

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 4/12/14 **COMPLETED** 4/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 3m by 1m **LOGGED BY** AR **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E					Topsoil	Silty Clayey SAND, brown, fine grained, root fibres, and tree roots.	PID: 4.5 PPM	
					SC	NATURAL: Clayey SAND, brown, medium grained, with igneous gravel, and tree roots.		
			0.5				PID: 4.7 PPM	
			1.0			Borehole TP21 terminated at 0.6m		

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TEST PIT NUMBER TP22

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 4/12/14 **COMPLETED** 4/12/14 **R.L. SURFACE** _____ **DATUM** _____

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** _____

TEST PIT SIZE 2m by 0.6m **LOGGED BY** AR **CHECKED BY** BK

NOTES _____

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Sandy, Gravelly, CLAY, brown, low plasticity, siltstone gravel, and cobbles.	PID: 0.4 PPM	Ash, slag, metal, and brick. No ACM Observed.
			0.5				PID: 0.5 PPM	
			1.0		FILL	FILL: Clayey SAND, brown, medium grained.	PID: 0.2 PPM	Metal fragments. No ACM Observed.
			1.5					
			2.0				PID: 0.0 PPM	Metal and timber fragments. No ACM Observed.
			2.5		SC	Natural: Clayey SAND, yellow-orange, medium grained.		
			3.0			Borehole TP22 terminated at 2.7m		
			3.5					
			4.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

TEST PIT NUMBER TP23

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Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 4/12/14 **COMPLETED** 4/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR Irwin & Hartshorn **SLOPE** --- **BEARING** ---

EQUIPMENT Excavator **TEST PIT LOCATION** ---

TEST PIT SIZE 2m by 0.6m **LOGGED BY** AR **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
E			0.0		FILL	FILL: Clayey SAND, brown, medium grained, siltstone gravel and cobbles, and roots and rootlets.	PID: 0.5 PPM	Minor brick, ash, and slag. No ACM Observed.
			0.5				PID: 0.0 PPM	
			1.0				PID: 1.5 PPM	
			1.5		SC	NATURAL: Clayey SAND, yellow-orange, medium grained.		
			2.0				PID: 0.5 PPM	
						Borehole TP23 terminated at 2m		
			2.5					
			3.0					
			3.5					
			4.0					

TEST PIT NUMBER TP24

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 4/12/14 **COMPLETED** 4/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR NA **SLOPE** --- **BEARING** ---

EQUIPMENT Shovel **TEST PIT LOCATION**

TEST PIT SIZE Surface Sample **LOGGED BY** AR **CHECKED BY** BK

NOTES

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
Shovel					Topsoil	Clayey SAND, dark brown, fine to medium grained, with organic matter, and pine needles.	PID: 0.1 PPM	
			0.5			Borehole TP24 terminated at 0.1m		
			1.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

Robson Environmental Pty Ltd
140 Gladstone Street
Fyshwick ACT 2609

TEST PIT NUMBER TP25

CLIENT Capcorp Constructions Pty Ltd **PROJECT NAME** Canberra Brickworks Remediation Project

PROJECT NUMBER 9623 **PROJECT LOCATION** Canberra Brickworks

DATE STARTED 4/12/14 **COMPLETED** 4/12/14 **R.L. SURFACE** --- **DATUM** ---

EXCAVATION CONTRACTOR NA **SLOPE** --- **BEARING** ---

EQUIPMENT Shovel **TEST PIT LOCATION** ---

TEST PIT SIZE Surface Sample **LOGGED BY** AR **CHECKED BY** BK

NOTES ---

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Additional Observations
Shovel					Topsoil	Clayey SAND, dark brown, fine to medium grained, with organic matter, and pine needles.	PID: 0.7 PPM	
			0.5			Borehole TP25 terminated at 0.1m		
			1.0					

BOREHOLE / TEST PIT ESDAT_GINT.GPJ GINT STD AUSTRALIA.GDT 4/2/15

Appendix F

Sample Receipts, COC Documentation and Laboratory Reports

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Ben Kendon	Manager	Huong Crawford
Client	Robson Environmental Pty Ltd	Laboratory	SGS Alexandria Environmental
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	(02) 6239 5656	Telephone	+61 2 8594 0400
Facsimile	(02) 6239 5669	Facsimile	+61 2 8594 0499
Email	ben@robsonlabs.com.au	Email	au.environmental.sydney@sgs.com
Project	**9623 - ESA - Old Canberra Brickworks**	SGS Reference	**SE134169 R0**
Order Number	(Not specified)	Report Number	0000098771
Samples	15	Date Reported	17 Dec 2014
Date Started	09 Dec 2014	Date Received	05 Dec 2014

COMMENTS

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

No respirable fibres detected in all samples using trace analysis technique as per AS 4964-2004.
FA+AF measured gravimatically (excluding free fibres).
Asbestos weight is approximate.
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Andy Sutton
Senior Organic Chemist

Deanne Norris
Organic Chemist

Dong Liang
Metals/Inorganics Team Leader

Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Parameter	Units	LOR	Sample Number: SE134169.001 Sample Matrix: Soil Sample Date: 04 Dec 2014 Sample Name: TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
VOC's in Soil Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	-	<0.1	-
Toluene	mg/kg	0.1	<0.1	-	<0.1	-
Ethylbenzene	mg/kg	0.1	<0.1	-	<0.1	-
m/p-xylene	mg/kg	0.2	<0.2	-	<0.2	-
o-xylene	mg/kg	0.1	<0.1	-	<0.1	-
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	<0.1	-	<0.1	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**70**	-	**73**	-
d4-1,2-dichloroethane (Surrogate)	%	-	**85**	-	**84**	-
d8-toluene (Surrogate)	%	-	**85**	-	**88**	-
Bromofluorobenzene (Surrogate)	%	-	**75**	-	**76**	-
Totals						
Total Xylenes*	mg/kg	0.3	<0.3	-	<0.3	-
Total BTEX*	mg/kg	0.6	<0.6	-	<0.6	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	-	<25	-
TRH C6-C9	mg/kg	20	<20	-	<20	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**70**	-	**73**	-
d4-1,2-dichloroethane (Surrogate)	%	-	**85**	-	**84**	-
d8-toluene (Surrogate)	%	-	**85**	-	**88**	-
Bromofluorobenzene (Surrogate)	%	-	**75**	-	**76**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)						
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	-	<0.1	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	-	<25	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403						
TRH C10-C14	mg/kg	20	<20	-	<20	-
TRH C15-C28	mg/kg	45	<45	-	<45	-
TRH C29-C36	mg/kg	45	<45	-	<45	-
TRH C37-C40	mg/kg	100	<100	-	<100	-
TRH C10-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	<25	-	<25	-
TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	<25	-	<25	-
TRH >C16-C34 (F3)	mg/kg	90	<90	-	<90	-
TRH >C34-C40 (F4)	mg/kg	120	<120	-	<120	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420						
Naphthalene	mg/kg	0.1	<0.1	-	<0.1	-
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	<0.1	-	<0.1	-
Acenaphthene	mg/kg	0.1	<0.1	-	<0.1	-
Fluorene	mg/kg	0.1	<0.1	-	<0.1	-
Phenanthrene	mg/kg	0.1	<0.1	-	<0.1	-
Anthracene	mg/kg	0.1	<0.1	-	<0.1	-
Fluoranthene	mg/kg	0.1	<0.1	-	<0.1	-
Pyrene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(a)anthracene	mg/kg	0.1	<0.1	-	<0.1	-
Chrysene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(a)pyrene	mg/kg	0.1	<0.1	-	<0.1	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	<0.1	-
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	-	<0.1	-
Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	<0.1	-
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0*	TEQ	0.2	<0.2	-	<0.2	-
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	-	<0.3	-
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	-	<0.2	-
Total PAH	mg/kg	0.8	<0.8	-	<0.8	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	**116**	-	**102**	-
2-fluorobiphenyl (Surrogate)	%	-	**98**	-	**86**	-
d14-p-terphenyl (Surrogate)	%	-	**106**	-	**88**	-
Speciated Phenols in Soil Method: AN420						
Phenol	mg/kg	0.5	<0.5	-	<0.5	-
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	-	**1.0**	-
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	-	<1	-
Total Cresol	mg/kg	1.5	<1.5	-	<1.5	-
2-chlorophenol	mg/kg	0.5	<0.5	-	<0.5	-
2,4-dimethylphenol	mg/kg	0.5	<0.5	-	<0.5	-
2,6-dichlorophenol	mg/kg	0.5	<0.5	-	<0.5	-
2,4-dichlorophenol	mg/kg	0.5	<0.5	-	<0.5	-
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	-	<0.5	-
2-nitrophenol	mg/kg	0.5	<0.5	-	<0.5	-
4-nitrophenol	mg/kg	1	<1	-	<1	-
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	-	<0.5	-
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	-	<1	-
Pentachlorophenol	mg/kg	0.5	<0.5	-	<0.5	-
2,4-dinitrophenol	mg/kg	2	<2	-	<2	-
4-chloro-3-methylphenol	mg/kg	2	<2	-	<2	-
Surrogates						
2,4,6-Tribromophenol (Surrogate)	%	-	**83**	-	**84**	-
d5-phenol (Surrogate)	%	-	**70**	-	**73**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
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	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**100**	-	**98**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
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	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**100**	-	**98**	-
pH in soil (1:5) Method: AN101						
pH	pH Units	-	-	**7.0**	-	-
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122						
Exchangeable Sodium, Na	mg/kg	2	-	**23**	-	-
Exchangeable Sodium, Na	meq/100g	0.01	-	**0.10**	-	-
Exchangeable Sodium Percentage*	%	0.1	-	**1.5**	-	-
Exchangeable Potassium, K	mg/kg	2	-	**170**	-	-
Exchangeable Potassium, K	meq/100g	0.01	-	**0.43**	-	-
Exchangeable Potassium Percentage*	%	0.1	-	**6.6**	-	-
Exchangeable Calcium, Ca	mg/kg	2	-	**680**	-	-
Exchangeable Calcium, Ca	meq/100g	0.01	-	**3.4**	-	-
Exchangeable Calcium Percentage*	%	0.1	-	**52.7**	-	-
Exchangeable Magnesium, Mg	mg/kg	2	-	**310**	-	-
Exchangeable Magnesium, Mg	meq/100g	0.02	-	**2.5**	-	-
Exchangeable Magnesium Percentage*	%	0.1	-	**39.2**	-	-
Cation Exchange Capacity	meq/100g	0.02	-	**6.4**	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
TOC in Soil Method: AN188							
Total Organic Carbon	%w/w	0.05		-	**0.56**	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320							
Arsenic, As	mg/kg	3		**3**	**3**	<3	**4**
Cadmium, Cd	mg/kg	0.3		<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3		**30**	**33**	**26**	**30**
Copper, Cu	mg/kg	0.5		**6.8**	**13**	**7.1**	**15**
Lead, Pb	mg/kg	1		**22**	**17**	**19**	**67**
Iron, Fe	mg/kg	50		-	**24000**	-	-
Nickel, Ni	mg/kg	0.5		**7.7**	**8.6**	**6.4**	**12**
Zinc, Zn	mg/kg	0.5		**27**	**28**	**28**	**25**
Particle sizing of soils <75µm by hydrometer Method: AN005							
Sedimentation Diameter 1	mm	0.0001		-	**0.0540**	-	-
Passing Sedimentation Diameter 1	%w/w	1		-	**53**	-	-
Retained Sedimentation Diameter 1	%w/w	1		-	**6**	-	-
Sedimentation Diameter 2	mm	0.0001		-	**0.0384**	-	-
Passing Sedimentation Diameter 2	%w/w	1		-	**51**	-	-
Retained Sedimentation Diameter 2	%w/w	1		-	**2**	-	-
Sedimentation Diameter 3	mm	0.0001		-	**0.0275**	-	-
Passing Sedimentation Diameter 3	%w/w	1		-	**46**	-	-
Retained Sedimentation Diameter 3	%w/w	1		-	**5**	-	-
Sedimentation Diameter 4	mm	0.0001		-	**0.0197**	-	-
Passing Sedimentation Diameter 4	%w/w	1		-	**41**	-	-
Retained Sedimentation Diameter 4	%w/w	1		-	**5**	-	-
Sedimentation Diameter 5	mm	0.0001		-	**0.0146**	-	-
Passing Sedimentation Diameter 5	%w/w	1		-	**37**	-	-
Retained Sedimentation Diameter 5	%w/w	1		-	**5**	-	-
Sedimentation Diameter 6	mm	0.0001		-	**0.0104**	-	-
Passing Sedimentation Diameter 6	%w/w	1		-	**34**	-	-
Retained Sedimentation Diameter 6	%w/w	1		-	**2**	-	-
Sedimentation Diameter 7	mm	0.0001		-	**0.0074**	-	-
Passing Sedimentation Diameter 7	%w/w	1		-	**32**	-	-
Retained Sedimentation Diameter 7	%w/w	1		-	**2**	-	-
Sedimentation Diameter 8	mm	0.0001		-	**0.0052**	-	-
Passing Sedimentation Diameter 8	%w/w	1		-	**32**	-	-
Retained Sedimentation Diameter 8	%w/w	1		-	<1	-	-
Sedimentation Diameter 9	mm	0.0001		-	**0.0037**	-	-
Passing Sedimentation Diameter 9	%w/w	1		-	**32**	-	-
Retained Sedimentation Diameter 9	%w/w	1		-	<1	-	-
Sedimentation Diameter 10	mm	0.0001		-	**0.0015**	-	-
Passing Sedimentation Diameter 10	%w/w	1		-	**29**	-	-
Retained Sedimentation Diameter 10	%w/w	1		-	**2**	-	-
Sedimentation Diameter 11	mm	0.0001		-	**0.0011**	-	-
Passing Sedimentation Diameter 11	%w/w	1		-	**29**	-	-
Retained Sedimentation Diameter 11	%w/w	1		-	<1	-	-
Mercury in Soil Method: AN312							
Mercury	mg/kg	0.01		**0.03**	**0.03**	**0.04**	**0.02**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
Gravimetric Determination of Asbestos in Soil Method: AN605						
Total Sample Weight*	g	1	**643**	**670**	**571**	**769**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5	**16**	**9.5**	**20**	**7.4**
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	-	-	-	-
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	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
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	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420						
Naphthalene	µg/L	0.1	-	-	-	-
2-methylnaphthalene	µg/L	0.1	-	-	-	-
1-methylnaphthalene	µg/L	0.1	-	-	-	-
Acenaphthylene	µg/L	0.1	-	-	-	-
Acenaphthene	µg/L	0.1	-	-	-	-
Fluorene	µg/L	0.1	-	-	-	-
Phenanthrene	µg/L	0.1	-	-	-	-
Anthracene	µg/L	0.1	-	-	-	-
Fluoranthene	µg/L	0.1	-	-	-	-
Pyrene	µg/L	0.1	-	-	-	-
Benzo(a)anthracene	µg/L	0.1	-	-	-	-
Chrysene	µg/L	0.1	-	-	-	-
Benzo(b&j)fluoranthene	µg/L	0.1	-	-	-	-
Benzo(k)fluoranthene	µg/L	0.1	-	-	-	-
Benzo(a)pyrene	µg/L	0.1	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	0.1	-	-	-	-
Dibenzo(a&h)anthracene	µg/L	0.1	-	-	-	-
Benzo(ghi)perylene	µg/L	0.1	-	-	-	-
Total PAH (18)	µg/L	1	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.001 Soil 04 Dec 2014 TP20 0.0-0.1	SE134169.002 Soil 04 Dec 2014 TP20 0.5-0.6	SE134169.003 Soil 04 Dec 2014 TP21 0.0-0.11	SE134169.004 Soil 04 Dec 2014 TP21 0.5-0.6
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
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: SE134169.005 Sample Matrix: Soil Sample Date: 04 Dec 2014 Sample Name: TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
VOC's in Soil Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	mg/kg	0.1	<0.1	-	-	<0.1
Toluene	mg/kg	0.1	<0.1	-	-	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	-	-	<0.1
m/p-xylene	mg/kg	0.2	<0.2	-	-	<0.2
o-xylene	mg/kg	0.1	<0.1	-	-	<0.1
Polycyclic VOCs						
Naphthalene	mg/kg	0.1	<0.1	-	-	<0.1
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**79**	-	-	**72**
d4-1,2-dichloroethane (Surrogate)	%	-	**92**	-	-	**84**
d8-toluene (Surrogate)	%	-	**97**	-	-	**86**
Bromofluorobenzene (Surrogate)	%	-	**87**	-	-	**73**
Totals						
Total Xylenes*	mg/kg	0.3	<0.3	-	-	<0.3
Total BTEX*	mg/kg	0.6	<0.6	-	-	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	-	-	<25
TRH C6-C9	mg/kg	20	<20	-	-	<20
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**79**	-	-	**72**
d4-1,2-dichloroethane (Surrogate)	%	-	**92**	-	-	**84**
d8-toluene (Surrogate)	%	-	**97**	-	-	**86**
Bromofluorobenzene (Surrogate)	%	-	**87**	-	-	**73**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)							
VPH F Bands							
Benzene (F0)	mg/kg	0.1		<0.1	-	-	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25		<25	-	-	<25
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403							
TRH C10-C14	mg/kg	20		<20	-	-	<20
TRH C15-C28	mg/kg	45		<45	-	-	<45
TRH C29-C36	mg/kg	45		<45	-	-	<45
TRH C37-C40	mg/kg	100		<100	-	-	<100
TRH C10-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		<25	-	-	<25
TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25		<25	-	-	<25
TRH >C16-C34 (F3)	mg/kg	90		<90	-	-	<90
TRH >C34-C40 (F4)	mg/kg	120		<120	-	-	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420							
Naphthalene	mg/kg	0.1		<0.1	-	-	<0.1
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		<0.1	-	-	<0.1
Acenaphthene	mg/kg	0.1		<0.1	-	-	<0.1
Fluorene	mg/kg	0.1		<0.1	-	-	<0.1
Phenanthrene	mg/kg	0.1		<0.1	-	-	<0.1
Anthracene	mg/kg	0.1		<0.1	-	-	<0.1
Fluoranthene	mg/kg	0.1		<0.1	-	-	<0.1
Pyrene	mg/kg	0.1		<0.1	-	-	<0.1
Benzo(a)anthracene	mg/kg	0.1		<0.1	-	-	<0.1
Chrysene	mg/kg	0.1		<0.1	-	-	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1		<0.1	-	-	<0.1
Benzo(k)fluoranthene	mg/kg	0.1		<0.1	-	-	<0.1
Benzo(a)pyrene	mg/kg	0.1		<0.1	-	-	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		<0.1	-	-	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1		<0.1	-	-	<0.1
Benzo(ghi)perylene	mg/kg	0.1		<0.1	-	-	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0*	TEQ	0.2		<0.2	-	-	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR*	TEQ (mg/kg)	0.3		<0.3	-	-	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2*	TEQ (mg/kg)	0.2		<0.2	-	-	<0.2
Total PAH	mg/kg	0.8		<0.8	-	-	<0.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	**94**	-	-	**94**
2-fluorobiphenyl (Surrogate)	%	-	**84**	-	-	**80**
d14-p-terphenyl (Surrogate)	%	-	**92**	-	-	**96**
Speciated Phenols in Soil Method: AN420						
Phenol	mg/kg	0.5	<0.5	-	-	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	-	-	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	-	-	<1
Total Cresol	mg/kg	1.5	<1.5	-	-	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	-	-	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	-	-	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	-	-	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	-	-	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	-	-	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	-	-	<0.5
4-nitrophenol	mg/kg	1	<1	-	-	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	-	-	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	-	-	<1
Pentachlorophenol	mg/kg	0.5	<0.5	-	-	<0.5
2,4-dinitrophenol	mg/kg	2	<2	-	-	<2
4-chloro-3-methylphenol	mg/kg	2	<2	-	-	<2
Surrogates						
2,4,6-Tribromophenol (Surrogate)	%	-	**80**	-	-	**88**
d5-phenol (Surrogate)	%	-	**73**	-	-	**75**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
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
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**93**	-	-	**95**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
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
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**93**	-	-	**95**
pH in soil (1:5) Method: AN101						
pH	pH Units	-	-	**8.4**	-	-
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122						
Exchangeable Sodium, Na	mg/kg	2	-	**15**	-	-
Exchangeable Sodium, Na	meq/100g	0.01	-	**0.06**	-	-
Exchangeable Sodium Percentage*	%	0.1	-	**0.3**	-	-
Exchangeable Potassium, K	mg/kg	2	-	**120**	-	-
Exchangeable Potassium, K	meq/100g	0.01	-	**0.31**	-	-
Exchangeable Potassium Percentage*	%	0.1	-	**1.5**	-	-
Exchangeable Calcium, Ca	mg/kg	2	-	**3500**	-	-
Exchangeable Calcium, Ca	meq/100g	0.01	-	**17**	-	-
Exchangeable Calcium Percentage*	%	0.1	-	**87.4**	-	-
Exchangeable Magnesium, Mg	mg/kg	2	-	**260**	-	-
Exchangeable Magnesium, Mg	meq/100g	0.02	-	**2.1**	-	-
Exchangeable Magnesium Percentage*	%	0.1	-	**10.8**	-	-
Cation Exchange Capacity	meq/100g	0.02	-	**20**	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
TOC in Soil Method: AN188							
Total Organic Carbon	%w/w	0.05		-	**0.91**	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320							
Arsenic, As	mg/kg	3		**5**	**8**	-	**6**
Cadmium, Cd	mg/kg	0.3		<0.3	<0.3	-	<0.3
Chromium, Cr	mg/kg	0.3		**22**	**18**	-	**20**
Copper, Cu	mg/kg	0.5		**14**	**19**	-	**17**
Lead, Pb	mg/kg	1		**34**	**25**	-	**27**
Iron, Fe	mg/kg	50		-	**22000**	-	-
Nickel, Ni	mg/kg	0.5		**10**	**17**	-	**11**
Zinc, Zn	mg/kg	0.5		**45**	**63**	-	**49**
Particle sizing of soils <75µm by hydrometer Method: AN005							
Sedimentation Diameter 1	mm	0.0001		-	**0.0520**	-	-
Passing Sedimentation Diameter 1	%w/w	1		-	**37**	-	-
Retained Sedimentation Diameter 1	%w/w	1		-	**1**	-	-
Sedimentation Diameter 2	mm	0.0001		-	**0.0369**	-	-
Passing Sedimentation Diameter 2	%w/w	1		-	**36**	-	-
Retained Sedimentation Diameter 2	%w/w	1		-	**1**	-	-
Sedimentation Diameter 3	mm	0.0001		-	**0.0262**	-	-
Passing Sedimentation Diameter 3	%w/w	1		-	**34**	-	-
Retained Sedimentation Diameter 3	%w/w	1		-	**2**	-	-
Sedimentation Diameter 4	mm	0.0001		-	**0.0187**	-	-
Passing Sedimentation Diameter 4	%w/w	1		-	**31**	-	-
Retained Sedimentation Diameter 4	%w/w	1		-	**2**	-	-
Sedimentation Diameter 5	mm	0.0001		-	**0.0137**	-	-
Passing Sedimentation Diameter 5	%w/w	1		-	**29**	-	-
Retained Sedimentation Diameter 5	%w/w	1		-	**2**	-	-
Sedimentation Diameter 6	mm	0.0001		-	**0.0098**	-	-
Passing Sedimentation Diameter 6	%w/w	1		-	**26**	-	-
Retained Sedimentation Diameter 6	%w/w	1		-	**3**	-	-
Sedimentation Diameter 7	mm	0.0001		-	**0.0070**	-	-
Passing Sedimentation Diameter 7	%w/w	1		-	**24**	-	-
Retained Sedimentation Diameter 7	%w/w	1		-	**2**	-	-
Sedimentation Diameter 8	mm	0.0001		-	**0.0049**	-	-
Passing Sedimentation Diameter 8	%w/w	1		-	**23**	-	-
Retained Sedimentation Diameter 8	%w/w	1		-	**1**	-	-
Sedimentation Diameter 9	mm	0.0001		-	**0.0035**	-	-
Passing Sedimentation Diameter 9	%w/w	1		-	**23**	-	-
Retained Sedimentation Diameter 9	%w/w	1		-	<1	-	-
Sedimentation Diameter 10	mm	0.0001		-	**0.0014**	-	-
Passing Sedimentation Diameter 10	%w/w	1		-	**21**	-	-
Retained Sedimentation Diameter 10	%w/w	1		-	**1**	-	-
Sedimentation Diameter 11	mm	0.0001		-	**0.0010**	-	-
Passing Sedimentation Diameter 11	%w/w	1		-	**20**	-	-
Retained Sedimentation Diameter 11	%w/w	1		-	**1**	-	-
Mercury in Soil Method: AN312							
Mercury	mg/kg	0.01		**0.02**	**0.03**	-	**0.02**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
Gravimetric Determination of Asbestos in Soil Method: AN605						
Total Sample Weight*	g	1	**690**	**762**	**715**	**615**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5	**13**	**9.0**	-	**13**
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	-	-	-	-
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	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
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	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420						
Naphthalene	µg/L	0.1	-	-	-	-
2-methylnaphthalene	µg/L	0.1	-	-	-	-
1-methylnaphthalene	µg/L	0.1	-	-	-	-
Acenaphthylene	µg/L	0.1	-	-	-	-
Acenaphthene	µg/L	0.1	-	-	-	-
Fluorene	µg/L	0.1	-	-	-	-
Phenanthrene	µg/L	0.1	-	-	-	-
Anthracene	µg/L	0.1	-	-	-	-
Fluoranthene	µg/L	0.1	-	-	-	-
Pyrene	µg/L	0.1	-	-	-	-
Benzo(a)anthracene	µg/L	0.1	-	-	-	-
Chrysene	µg/L	0.1	-	-	-	-
Benzo(b&j)fluoranthene	µg/L	0.1	-	-	-	-
Benzo(k)fluoranthene	µg/L	0.1	-	-	-	-
Benzo(a)pyrene	µg/L	0.1	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	0.1	-	-	-	-
Dibenzo(a&h)anthracene	µg/L	0.1	-	-	-	-
Benzo(ghi)perylene	µg/L	0.1	-	-	-	-
Total PAH (18)	µg/L	1	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.005 Soil 04 Dec 2014 TP22 0.0-0.1	SE134169.006 Soil 04 Dec 2014 TP22 0.4-0.5	SE134169.007 Soil 04 Dec 2014 TP22 1.9-2.0	SE134169.008 Soil 04 Dec 2014 TP23 0.0-0.1
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
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 Sample Matrix Sample Date Sample Name	SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
VOC's in Soil Method: AN433/AN434							
Monocyclic Aromatic Hydrocarbons							
Benzene	mg/kg	0.1		-	<0.1	<0.1	-
Toluene	mg/kg	0.1		-	<0.1	<0.1	-
Ethylbenzene	mg/kg	0.1		-	<0.1	<0.1	-
m/p-xylene	mg/kg	0.2		-	<0.2	<0.2	-
o-xylene	mg/kg	0.1		-	<0.1	<0.1	-
Polycyclic VOCs							
Naphthalene	mg/kg	0.1		-	<0.1	<0.1	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	**77**	**70**	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	**74**	**72**	-
d8-toluene (Surrogate)	%	-		-	**93**	**102**	-
Bromofluorobenzene (Surrogate)	%	-		-	**94**	**91**	-
Totals							
Total Xylenes*	mg/kg	0.3		-	<0.3	<0.3	-
Total BTEX*	mg/kg	0.6		-	<0.6	<0.6	-
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410							
TRH C6-C10	mg/kg	25		-	<25	<25	-
TRH C6-C9	mg/kg	20		-	<20	<20	-
Surrogates							
Dibromofluoromethane (Surrogate)	%	-		-	**77**	**70**	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	**74**	**72**	-
d8-toluene (Surrogate)	%	-		-	**93**	**102**	-
Bromofluorobenzene (Surrogate)	%	-		-	**94**	**91**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 (continued)							
VPH F Bands							
Benzene (F0)	mg/kg	0.1		-	<0.1	<0.1	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25		-	<25	<25	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403							
TRH C10-C14	mg/kg	20		-	<20	<20	-
TRH C15-C28	mg/kg	45		-	<45	**160**	-
TRH C29-C36	mg/kg	45		-	<45	**92**	-
TRH C37-C40	mg/kg	100		-	<100	<100	-
TRH C10-C36 Total	mg/kg	110		-	<110	**250**	-
TRH C10-C40 Total	mg/kg	210		-	<210	**250**	-
TRH F Bands							
TRH >C10-C16 (F2)	mg/kg	25		-	<25	<25	-
TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25		-	<25	<25	-
TRH >C16-C34 (F3)	mg/kg	90		-	<90	**210**	-
TRH >C34-C40 (F4)	mg/kg	120		-	<120	<120	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420							
Naphthalene	mg/kg	0.1		-	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1		-	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1		-	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0*	TEQ	0.2		-	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR*	TEQ (mg/kg)	0.3		-	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2*	TEQ (mg/kg)	0.2		-	<0.2	<0.2	<0.2
Total PAH	mg/kg	0.8		-	<0.8	<0.8	<0.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	**98**	**98**	**94**
2-fluorobiphenyl (Surrogate)	%	-		-	**84**	**90**	**82**
d14-p-terphenyl (Surrogate)	%	-		-	**90**	**92**	**96**
Speciated Phenols in Soil Method: AN420							
Phenol	mg/kg	0.5		-	<0.5	<0.5	-
2-methyl phenol (o-cresol)	mg/kg	0.5		-	<0.5	<0.5	-
3/4-methyl phenol (m/p-cresol)	mg/kg	1		-	<1	<1	-
Total Cresol	mg/kg	1.5		-	<1.5	<1.5	-
2-chlorophenol	mg/kg	0.5		-	<0.5	<0.5	-
2,4-dimethylphenol	mg/kg	0.5		-	<0.5	<0.5	-
2,6-dichlorophenol	mg/kg	0.5		-	<0.5	<0.5	-
2,4-dichlorophenol	mg/kg	0.5		-	<0.5	<0.5	-
2,4,6-trichlorophenol	mg/kg	0.5		-	<0.5	<0.5	-
2-nitrophenol	mg/kg	0.5		-	<0.5	<0.5	-
4-nitrophenol	mg/kg	1		-	<1	<1	-
2,4,5-trichlorophenol	mg/kg	0.5		-	<0.5	<0.5	-
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1		-	<1	<1	-
Pentachlorophenol	mg/kg	0.5		-	<0.5	<0.5	-
2,4-dinitrophenol	mg/kg	2		-	<2	<2	-
4-chloro-3-methylphenol	mg/kg	2		-	<2	<2	-
Surrogates							
2,4,6-Tribromophenol (Surrogate)	%	-		-	**75**	**88**	-
d5-phenol (Surrogate)	%	-		-	**73**	**71**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
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	-
Surrogates							
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	**89**	**113**	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
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	-
Surrogates							
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	**89**	**113**	-
pH in soil (1:5) Method: AN101							
pH	pH Units	-		**7.7**	-	-	-
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122							
Exchangeable Sodium, Na	mg/kg	2		**15**	-	-	-
Exchangeable Sodium, Na	meq/100g	0.01		**0.06**	-	-	-
Exchangeable Sodium Percentage*	%	0.1		**0.5**	-	-	-
Exchangeable Potassium, K	mg/kg	2		**110**	-	-	-
Exchangeable Potassium, K	meq/100g	0.01		**0.29**	-	-	-
Exchangeable Potassium Percentage*	%	0.1		**2.1**	-	-	-
Exchangeable Calcium, Ca	mg/kg	2		**1800**	-	-	-
Exchangeable Calcium, Ca	meq/100g	0.01		**8.9**	-	-	-
Exchangeable Calcium Percentage*	%	0.1		**64.7**	-	-	-
Exchangeable Magnesium, Mg	mg/kg	2		**550**	-	-	-
Exchangeable Magnesium, Mg	meq/100g	0.02		**4.5**	-	-	-
Exchangeable Magnesium Percentage*	%	0.1		**32.7**	-	-	-
Cation Exchange Capacity	meq/100g	0.02		**14**	-	-	-

Parameter	Units	LOR	Sample Number: SE134169.009 Sample Matrix: Soil Sample Date: 04 Dec 2014 Sample Name: TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
TOC in Soil Method: AN188						
Total Organic Carbon	%w/w	0.05	**1.3**	-	-	-
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320						
Arsenic, As	mg/kg	3	**7**	**6**	**6**	**7**
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	**16**	**37**	**32**	**19**
Copper, Cu	mg/kg	0.5	**20**	**8.8**	**7.1**	**19**
Lead, Pb	mg/kg	1	**25**	**34**	**29**	**26**
Iron, Fe	mg/kg	50	**24000**	-	-	-
Nickel, Ni	mg/kg	0.5	**18**	**6.4**	**7.0**	**13**
Zinc, Zn	mg/kg	0.5	**77**	**50**	**33**	**53**
Particle sizing of soils <75µm by hydrometer Method: AN005						
Sedimentation Diameter 1	mm	0.0001	**0.0540**	-	-	-
Passing Sedimentation Diameter 1	%w/w	1	**55**	-	-	-
Retained Sedimentation Diameter 1	%w/w	1	**1**	-	-	-
Sedimentation Diameter 2	mm	0.0001	**0.0384**	-	-	-
Passing Sedimentation Diameter 2	%w/w	1	**52**	-	-	-
Retained Sedimentation Diameter 2	%w/w	1	**2**	-	-	-
Sedimentation Diameter 3	mm	0.0001	**0.0275**	-	-	-
Passing Sedimentation Diameter 3	%w/w	1	**47**	-	-	-
Retained Sedimentation Diameter 3	%w/w	1	**5**	-	-	-
Sedimentation Diameter 4	mm	0.0001	**0.0195**	-	-	-
Passing Sedimentation Diameter 4	%w/w	1	**46**	-	-	-
Retained Sedimentation Diameter 4	%w/w	1	**1**	-	-	-
Sedimentation Diameter 5	mm	0.0001	**0.0144**	-	-	-
Passing Sedimentation Diameter 5	%w/w	1	**42**	-	-	-
Retained Sedimentation Diameter 5	%w/w	1	**4**	-	-	-
Sedimentation Diameter 6	mm	0.0001	**0.0102**	-	-	-
Passing Sedimentation Diameter 6	%w/w	1	**40**	-	-	-
Retained Sedimentation Diameter 6	%w/w	1	**2**	-	-	-
Sedimentation Diameter 7	mm	0.0001	**0.0073**	-	-	-
Passing Sedimentation Diameter 7	%w/w	1	**37**	-	-	-
Retained Sedimentation Diameter 7	%w/w	1	**2**	-	-	-
Sedimentation Diameter 8	mm	0.0001	**0.0052**	-	-	-
Passing Sedimentation Diameter 8	%w/w	1	**34**	-	-	-
Retained Sedimentation Diameter 8	%w/w	1	**4**	-	-	-
Sedimentation Diameter 9	mm	0.0001	**0.0037**	-	-	-
Passing Sedimentation Diameter 9	%w/w	1	**32**	-	-	-
Retained Sedimentation Diameter 9	%w/w	1	**1**	-	-	-
Sedimentation Diameter 10	mm	0.0001	**0.0015**	-	-	-
Passing Sedimentation Diameter 10	%w/w	1	**31**	-	-	-
Retained Sedimentation Diameter 10	%w/w	1	**1**	-	-	-
Sedimentation Diameter 11	mm	0.0001	**0.0011**	-	-	-
Passing Sedimentation Diameter 11	%w/w	1	**30**	-	-	-
Retained Sedimentation Diameter 11	%w/w	1	**1**	-	-	-
Mercury in Soil Method: AN312						
Mercury	mg/kg	0.01	**0.03**	**0.03**	**0.04**	**0.02**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
Gravimetric Determination of Asbestos in Soil Method: AN605						
Total Sample Weight*	g	1	**601**	**438**	**418**	**587**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5	**10**	**16**	**13**	**12**
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	-	-	-	-
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	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
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	-	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420						
Naphthalene	µg/L	0.1	-	-	-	-
2-methylnaphthalene	µg/L	0.1	-	-	-	-
1-methylnaphthalene	µg/L	0.1	-	-	-	-
Acenaphthylene	µg/L	0.1	-	-	-	-
Acenaphthene	µg/L	0.1	-	-	-	-
Fluorene	µg/L	0.1	-	-	-	-
Phenanthrene	µg/L	0.1	-	-	-	-
Anthracene	µg/L	0.1	-	-	-	-
Fluoranthene	µg/L	0.1	-	-	-	-
Pyrene	µg/L	0.1	-	-	-	-
Benzo(a)anthracene	µg/L	0.1	-	-	-	-
Chrysene	µg/L	0.1	-	-	-	-
Benzo(b&j)fluoranthene	µg/L	0.1	-	-	-	-
Benzo(k)fluoranthene	µg/L	0.1	-	-	-	-
Benzo(a)pyrene	µg/L	0.1	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	0.1	-	-	-	-
Dibenzo(a&h)anthracene	µg/L	0.1	-	-	-	-
Benzo(ghi)perylene	µg/L	0.1	-	-	-	-
Total PAH (18)	µg/L	1	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.009 Soil 04 Dec 2014 TP23 0.9-1.0	SE134169.010 Soil 04 Dec 2014 TP24 0.0-0.1	SE134169.011 Soil 04 Dec 2014 TP25 0.0-0.1	SE134169.012 Soil 04 Dec 2014 QC 1
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
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 Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
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 Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
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) minus 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 (as BaP TEQ)-assume results <LOR=0*	TEQ	0.2		-	-	-
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR*	TEQ (mg/kg)	0.3		-	-	-
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2*	TEQ (mg/kg)	0.2		-	-	-
Total PAH	mg/kg	0.8		-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-		-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-
Speciated Phenols in Soil Method: AN420						
Phenol	mg/kg	0.5		-	-	-
2-methyl phenol (o-cresol)	mg/kg	0.5		-	-	-
3/4-methyl phenol (m/p-cresol)	mg/kg	1		-	-	-
Total Cresol	mg/kg	1.5		-	-	-
2-chlorophenol	mg/kg	0.5		-	-	-
2,4-dimethylphenol	mg/kg	0.5		-	-	-
2,6-dichlorophenol	mg/kg	0.5		-	-	-
2,4-dichlorophenol	mg/kg	0.5		-	-	-
2,4,6-trichlorophenol	mg/kg	0.5		-	-	-
2-nitrophenol	mg/kg	0.5		-	-	-
4-nitrophenol	mg/kg	1		-	-	-
2,4,5-trichlorophenol	mg/kg	0.5		-	-	-
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1		-	-	-
Pentachlorophenol	mg/kg	0.5		-	-	-
2,4-dinitrophenol	mg/kg	2		-	-	-
4-chloro-3-methylphenol	mg/kg	2		-	-	-
Surrogates						
2,4,6-Tribromophenol (Surrogate)	%	-		-	-	-
d5-phenol (Surrogate)	%	-		-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
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		-	-	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
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		-	-	-
Surrogates						
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	-	-
pH in soil (1:5) Method: AN101						
pH	pH Units	-		-	-	-
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122						
Exchangeable Sodium, Na	mg/kg	2		-	-	-
Exchangeable Sodium, Na	meq/100g	0.01		-	-	-
Exchangeable Sodium Percentage*	%	0.1		-	-	-
Exchangeable Potassium, K	mg/kg	2		-	-	-
Exchangeable Potassium, K	meq/100g	0.01		-	-	-
Exchangeable Potassium Percentage*	%	0.1		-	-	-
Exchangeable Calcium, Ca	mg/kg	2		-	-	-
Exchangeable Calcium, Ca	meq/100g	0.01		-	-	-
Exchangeable Calcium Percentage*	%	0.1		-	-	-
Exchangeable Magnesium, Mg	mg/kg	2		-	-	-
Exchangeable Magnesium, Mg	meq/100g	0.02		-	-	-
Exchangeable Magnesium Percentage*	%	0.1		-	-	-
Cation Exchange Capacity	meq/100g	0.02		-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
TOC in Soil Method: AN188						
Total Organic Carbon	%w/w	0.05		-	-	-
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		-	-	-
Iron, Fe	mg/kg	50		-	-	-
Nickel, Ni	mg/kg	0.5		-	-	-
Zinc, Zn	mg/kg	0.5		-	-	-
Particle sizing of soils <75µm by hydrometer Method: AN005						
Sedimentation Diameter 1	mm	0.0001		-	-	-
Passing Sedimentation Diameter 1	%w/w	1		-	-	-
Retained Sedimentation Diameter 1	%w/w	1		-	-	-
Sedimentation Diameter 2	mm	0.0001		-	-	-
Passing Sedimentation Diameter 2	%w/w	1		-	-	-
Retained Sedimentation Diameter 2	%w/w	1		-	-	-
Sedimentation Diameter 3	mm	0.0001		-	-	-
Passing Sedimentation Diameter 3	%w/w	1		-	-	-
Retained Sedimentation Diameter 3	%w/w	1		-	-	-
Sedimentation Diameter 4	mm	0.0001		-	-	-
Passing Sedimentation Diameter 4	%w/w	1		-	-	-
Retained Sedimentation Diameter 4	%w/w	1		-	-	-
Sedimentation Diameter 5	mm	0.0001		-	-	-
Passing Sedimentation Diameter 5	%w/w	1		-	-	-
Retained Sedimentation Diameter 5	%w/w	1		-	-	-
Sedimentation Diameter 6	mm	0.0001		-	-	-
Passing Sedimentation Diameter 6	%w/w	1		-	-	-
Retained Sedimentation Diameter 6	%w/w	1		-	-	-
Sedimentation Diameter 7	mm	0.0001		-	-	-
Passing Sedimentation Diameter 7	%w/w	1		-	-	-
Retained Sedimentation Diameter 7	%w/w	1		-	-	-
Sedimentation Diameter 8	mm	0.0001		-	-	-
Passing Sedimentation Diameter 8	%w/w	1		-	-	-
Retained Sedimentation Diameter 8	%w/w	1		-	-	-
Sedimentation Diameter 9	mm	0.0001		-	-	-
Passing Sedimentation Diameter 9	%w/w	1		-	-	-
Retained Sedimentation Diameter 9	%w/w	1		-	-	-
Sedimentation Diameter 10	mm	0.0001		-	-	-
Passing Sedimentation Diameter 10	%w/w	1		-	-	-
Retained Sedimentation Diameter 10	%w/w	1		-	-	-
Sedimentation Diameter 11	mm	0.0001		-	-	-
Passing Sedimentation Diameter 11	%w/w	1		-	-	-
Retained Sedimentation Diameter 11	%w/w	1		-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
Mercury in Soil Method: AN312						
Mercury	mg/kg	0.01		-	-	-
Gravimetric Determination of Asbestos in Soil Method: AN605						
Total Sample Weight*	g	1		-	-	-
Asbestos in soil (>7mm ACM)*	%w/w	0.01		-	-	-
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001		-	-	-
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001		-	-	-
Fibre Type*	No unit	-		-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5		-	-	-
VOCs in Water Method: AN433/AN434						
Monocyclic Aromatic Hydrocarbons						
Benzene	µg/L	0.5		-	<0.5	[91%]
Toluene	µg/L	0.5		-	<0.5	[93%]
Ethylbenzene	µg/L	0.5		-	<0.5	[94%]
m/p-xylene	µg/L	1		-	<1	[96%]
o-xylene	µg/L	0.5		-	<0.5	[97%]
Polycyclic VOCs						
Naphthalene	µg/L	0.5		-	<0.5	<0.5
Surrogates						
Dibromofluoromethane (Surrogate)	%	-		-	**117**	**94**
d4-1,2-dichloroethane (Surrogate)	%	-		-	**111**	**91**
d8-toluene (Surrogate)	%	-		-	**98**	**91**
Bromofluorobenzene (Surrogate)	%	-		-	**83**	**111**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
VOCs in Water Method: AN433/AN434 (continued)						
Totals						
Total Xylenes	µg/L	1.5		-	<1.5	-
Total BTEX	µg/L	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)	%	-		-	**117**	-
d4-1,2-dichloroethane (Surrogate)	%	-		-	**111**	-
d8-toluene (Surrogate)	%	-		-	**98**	-
Bromofluorobenzene (Surrogate)	%	-		-	**83**	-
VPH F Bands						
Benzene (F0)	µg/L	0.5		-	<0.5	-
TRH C6-C10 minus BTEX (F1)	µg/L	50		-	<50	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420						
Naphthalene	µg/L	0.1		<0.1	-	-
2-methylnaphthalene	µg/L	0.1		<0.1	-	-
1-methylnaphthalene	µg/L	0.1		<0.1	-	-
Acenaphthylene	µg/L	0.1		<0.1	-	-
Acenaphthene	µg/L	0.1		<0.1	-	-
Fluorene	µg/L	0.1		<0.1	-	-
Phenanthrene	µg/L	0.1		<0.1	-	-
Anthracene	µg/L	0.1		<0.1	-	-
Fluoranthene	µg/L	0.1		<0.1	-	-
Pyrene	µg/L	0.1		<0.1	-	-
Benzo(a)anthracene	µg/L	0.1		<0.1	-	-
Chrysene	µg/L	0.1		<0.1	-	-
Benzo(b&j)fluoranthene	µg/L	0.1		<0.1	-	-
Benzo(k)fluoranthene	µg/L	0.1		<0.1	-	-
Benzo(a)pyrene	µg/L	0.1		<0.1	-	-
Indeno(1,2,3-cd)pyrene	µg/L	0.1		<0.1	-	-
Dibenzo(a&h)anthracene	µg/L	0.1		<0.1	-	-
Benzo(ghi)perylene	µg/L	0.1		<0.1	-	-
Total PAH (18)	µg/L	1		<1	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134169.013 Water 04 Dec 2014 R1	SE134169.014 Water 04 Dec 2014 Trip Blank 1	SE134169.015 Water 04 Dec 2014 Trip Spike 1
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-		**64**	-	-
2-fluorobiphenyl (Surrogate)	%	-		**62**	-	-
d14-p-terphenyl (Surrogate)	%	-		**86**	-	-
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		**3**	-	-
Lead, Pb	µg/L	1		<1	-	-
Nickel, Ni	µg/L	1		<1	-	-
Zinc, Zn	µg/L	5		**14**	-	-
Mercury (dissolved) in Water Method: AN311/AN312						
Mercury	mg/L	0.0001		**0.0002**	-	-

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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: ME-(AU)-[ENV]AN122

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Exchangeable Sodium, Na	LB069122	mg/kg	2		84%
Exchangeable Sodium, Na	LB069122	meq/100g	0.01	<0.01	NA
Exchangeable Sodium Percentage*	LB069122	%	0.1	90.3	NA
Exchangeable Potassium, K	LB069122	mg/kg	2		95%
Exchangeable Potassium, K	LB069122	meq/100g	0.01	<0.01	NA
Exchangeable Potassium Percentage*	LB069122	%	0.1	33.2	NA
Exchangeable Calcium, Ca	LB069122	mg/kg	2		86%
Exchangeable Calcium, Ca	LB069122	meq/100g	0.01	<0.01	NA
Exchangeable Calcium Percentage*	LB069122	%	0.1	<0.1	NA
Exchangeable Magnesium, Mg	LB069122	mg/kg	2		86%
Exchangeable Magnesium, Mg	LB069122	meq/100g	0.02	<0.02	NA
Exchangeable Magnesium Percentage*	LB069122	%	0.1	<0.1	NA
Cation Exchange Capacity	LB069122	meq/100g	0.02	<0.02	NA

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB069222	mg/L	0.0001	<0.0001	0%	90%	98%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB069015	mg/kg	0.01	<0.01	0%	103%	76%
	LB069016	mg/kg	0.01	<0.01	0%	104%	95%

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

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB068977	%	0.5	3 - 12%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Hexachlorobenzene (HCB)	LB068883	mg/kg	0.1	<0.1	0%	NA
Alpha BHC	LB068883	mg/kg	0.1	<0.1	0%	NA
Lindane	LB068883	mg/kg	0.1	<0.1	0%	NA
Heptachlor	LB068883	mg/kg	0.1	<0.1	0%	109%
Aldrin	LB068883	mg/kg	0.1	<0.1	0%	108%
Beta BHC	LB068883	mg/kg	0.1	<0.1	0%	NA
Delta BHC	LB068883	mg/kg	0.1	<0.1	0%	106%
Heptachlor epoxide	LB068883	mg/kg	0.1	<0.1	0%	NA
o,p'-DDE	LB068883	mg/kg	0.1	<0.1	0%	NA
Alpha Endosulfan	LB068883	mg/kg	0.2	<0.2	0%	NA
Gamma Chlordane	LB068883	mg/kg	0.1	<0.1	0%	NA
Alpha Chlordane	LB068883	mg/kg	0.1	<0.1	0%	NA
trans-Nonachlor	LB068883	mg/kg	0.1	<0.1	0%	NA
p,p'-DDE	LB068883	mg/kg	0.1	<0.1	0%	NA
Dieldrin	LB068883	mg/kg	0.2	<0.2	0%	104%
Endrin	LB068883	mg/kg	0.2	<0.2	0%	113%
o,p'-DDD	LB068883	mg/kg	0.1	<0.1	0%	NA
o,p'-DDT	LB068883	mg/kg	0.1	<0.1	0%	NA
Beta Endosulfan	LB068883	mg/kg	0.2	<0.2	0%	NA
p,p'-DDD	LB068883	mg/kg	0.1	<0.1	0%	NA
p,p'-DDT	LB068883	mg/kg	0.1	<0.1	0%	107%
Endosulfan sulphate	LB068883	mg/kg	0.1	<0.1	0%	NA
Endrin Aldehyde	LB068883	mg/kg	0.1	<0.1	0%	NA
Methoxychlor	LB068883	mg/kg	0.1	<0.1	0%	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.

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

				MB	DUP %RPD	LCS %Recovery
Endrin Ketone	LB068883	mg/kg	0.1	<0.1	0%	NA
Isodrin	LB068883	mg/kg	0.1	<0.1	0%	NA
Mirex	LB068883	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB068883	%	-	102%	2%	111%

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.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB068883	mg/kg	0.1	<0.1	0%	98%	110%
2-methylnaphthalene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
1-methylnaphthalene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Acenaphthylene	LB068883	mg/kg	0.1	<0.1	0%	100%	114%
Acenaphthene	LB068883	mg/kg	0.1	<0.1	0%	96%	108%
Fluorene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Phenanthrene	LB068883	mg/kg	0.1	<0.1	0%	109%	116%
Anthracene	LB068883	mg/kg	0.1	<0.1	0%	105%	123%
Fluoranthene	LB068883	mg/kg	0.1	<0.1	10%	111%	117%
Pyrene	LB068883	mg/kg	0.1	<0.1	18%	106%	119%
Benzo(a)anthracene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Chrysene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(b&j)fluoranthene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(k)fluoranthene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(a)pyrene	LB068883	mg/kg	0.1	<0.1	0%	104%	115%
Indeno(1,2,3-cd)pyrene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Dibenzo(a&h)anthracene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(ghi)perylene	LB068883	mg/kg	0.1	<0.1	0%	NA	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=0*	LB068883	TEQ	0.2	<0.2	0%	NA	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR*	LB068883	TEQ (mg/kg)	0.3	<0.3	0%	NA	NA
Carcinogenic PAHs (as BaP TEQ)-assume results <LOR=LOR/2*	LB068883	TEQ (mg/kg)	0.2	<0.2	0%	NA	NA
Total PAH	LB068883	mg/kg	0.8	<0.8	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB068883	%	-	100%	18%	84%	106%
2-fluorobiphenyl (Surrogate)	LB068883	%	-	82%	13%	76%	90%
d14-p-terphenyl (Surrogate)	LB068883	%	-	112%	21%	98%	84%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB068894	µg/L	0.1	<0.1	0%	101%
2-methylnaphthalene	LB068894	µg/L	0.1	<0.1	0%	NA
1-methylnaphthalene	LB068894	µg/L	0.1	<0.1	0%	NA
Acenaphthylene	LB068894	µg/L	0.1	<0.1	0%	98%
Acenaphthene	LB068894	µg/L	0.1	<0.1	0%	97%
Fluorene	LB068894	µg/L	0.1	<0.1	0%	NA
Phenanthrene	LB068894	µg/L	0.1	<0.1	0%	111%
Anthracene	LB068894	µg/L	0.1	<0.1	0%	109%
Fluoranthene	LB068894	µg/L	0.1	<0.1	0%	101%
Pyrene	LB068894	µg/L	0.1	<0.1	0%	110%
Benzo(a)anthracene	LB068894	µg/L	0.1	<0.1	0%	NA
Chrysene	LB068894	µg/L	0.1	<0.1	0%	NA
Benzo(b&j)fluoranthene	LB068894	µg/L	0.1	<0.1	0%	NA
Benzo(k)fluoranthene	LB068894	µg/L	0.1	<0.1	0%	NA
Benzo(a)pyrene	LB068894	µg/L	0.1	<0.1	0%	123%
Indeno(1,2,3-cd)pyrene	LB068894	µg/L	0.1	<0.1	0%	NA
Dibenzo(a&h)anthracene	LB068894	µg/L	0.1	<0.1	0%	NA
Benzo(ghi)perylene	LB068894	µg/L	0.1	<0.1	0%	NA
Total PAH (18)	LB068894	µg/L	1	<1		

Surrogates

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.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB068894	%	-	82%	0%	104%
2-fluorobiphenyl (Surrogate)	LB068894	%	-	72%	6%	94%
d14-p-terphenyl (Surrogate)	LB068894	%	-	94%	0%	116%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arochlor 1016	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1221	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1232	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1242	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1248	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1254	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1260	LB068883	mg/kg	0.2	<0.2	0%	93%
Arochlor 1262	LB068883	mg/kg	0.2	<0.2	0%	NA
Arochlor 1268	LB068883	mg/kg	0.2	<0.2	0%	NA
Total PCBs (Arochlors)	LB068883	mg/kg	1	<1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB068883	%	-	102%	2%	112%

pH in soil (1:5) Method: ME-(AU)-[ENV]AN101

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
pH	LB069166	pH Units	-	1%	99%

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.

Speciated Phenols in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Phenol	LB068883	mg/kg	0.5	<0.5	0%	89%
2-methyl phenol (o-cresol)	LB068883	mg/kg	0.5	<0.5	64%	NA
3/4-methyl phenol (m/p-cresol)	LB068883	mg/kg	1	<1	0%	NA
Total Cresol	LB068883	mg/kg	1.5	<1.5	0%	NA
2-chlorophenol	LB068883	mg/kg	0.5	<0.5	0%	NA
2,4-dimethylphenol	LB068883	mg/kg	0.5	<0.5	0%	NA
2,6-dichlorophenol	LB068883	mg/kg	0.5	<0.5	0%	NA
2,4-dichlorophenol	LB068883	mg/kg	0.5	<0.5	0%	107%
2,4,6-trichlorophenol	LB068883	mg/kg	0.5	<0.5	0%	112%
2-nitrophenol	LB068883	mg/kg	0.5	<0.5	0%	NA
4-nitrophenol	LB068883	mg/kg	1	<1	0%	NA
2,4,5-trichlorophenol	LB068883	mg/kg	0.5	<0.5	0%	NA
2,3,4,6/2,3,5,6-tetrachlorophenol	LB068883	mg/kg	1	<1	0%	NA
Pentachlorophenol	LB068883	mg/kg	0.5	<0.5	0%	73%
2,4-dinitrophenol	LB068883	mg/kg	2	<2	0%	NA
4-chloro-3-methylphenol	LB068883	mg/kg	2	<2	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
2,4,6-Tribromophenol (Surrogate)	LB068883	%	-	89%	2%	91%
d5-phenol (Surrogate)	LB068883	%	-	97%	2%	90%

TOC in Soil **Method: ME-(AU)-[ENV]AN188**

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
Total Organic Carbon	LB069173	%w/w	0.05	0 - 7%	96%

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	LB069012	mg/kg	3	<3	15 - 78%	91%	63%
	LB069013	mg/kg	3	<3	14%	90%	76%
Cadmium, Cd	LB069012	mg/kg	0.3	<0.3	0 - 5%	93%	71%
	LB069013	mg/kg	0.3	<0.3	1%	91%	81%
Chromium, Cr	LB069012	mg/kg	0.3	<0.3	7 - 24%	91%	54%
	LB069013	mg/kg	0.3	<0.3	4 - 9%	89%	65%
Copper, Cu	LB069012	mg/kg	0.5	<0.5	4 - 5%	93%	55%
	LB069013	mg/kg	0.5	<0.5	0 - 4%	92%	81%
Lead, Pb	LB069012	mg/kg	1	<1	4 - 24%	93%	51%
	LB069013	mg/kg	1	<1	4 - 6%	92%	70%
Iron, Fe	LB069012	mg/kg	50	<50	18%	92%	
	LB069013	mg/kg	50	<50		91%	
Nickel, Ni	LB069012	mg/kg	0.5	<0.5	2 - 11%	90%	64%
	LB069013	mg/kg	0.5	<0.5	8%	87%	76%
Zinc, Zn	LB069012	mg/kg	0.5	<0.5	4 - 5%	93%	36%
	LB069013	mg/kg	0.5	<0.5	7 - 8%	91%	75%

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	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB068946	µg/L	1	<1	3%	92%	93%
Cadmium, Cd	LB068946	µg/L	0.1	<0.1	0%	94%	97%
Chromium, Cr	LB068946	µg/L	1	<1	0%	96%	96%
Copper, Cu	LB068946	µg/L	1	<1	0%	99%	101%
Lead, Pb	LB068946	µg/L	1	<1	0%	97%	97%
Nickel, Ni	LB068946	µg/L	1	<1	0%	98%	98%
Zinc, Zn	LB068946	µg/L	5	<5	0%	96%	102%

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
TRH C10-C14	LB068883	mg/kg	20	<20	0%	100%
TRH C15-C28	LB068883	mg/kg	45	<45	0%	100%
TRH C29-C36	LB068883	mg/kg	45	<45	0%	83%
TRH C37-C40	LB068883	mg/kg	100	<100	0%	NA
TRH C10-C36 Total	LB068883	mg/kg	110	<110	0%	NA
TRH C10-C40 Total	LB068883	mg/kg	210	<210	0%	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
TRH >C10-C16 (F2)	LB068883	mg/kg	25	<25	0%	100%
TRH >C10-C16 (F2) minus Naphthalene	LB068883	mg/kg	25	<25	0%	NA
TRH >C16-C34 (F3)	LB068883	mg/kg	90	<90	0%	95%
TRH >C34-C40 (F4)	LB068883	mg/kg	120	<120	0%	80%

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	LB068917	mg/kg	0.1	<0.1	0%	84%	74%
Toluene	LB068917	mg/kg	0.1	<0.1	0%	86%	89%
Ethylbenzene	LB068917	mg/kg	0.1	<0.1	0%	86%	82%
m/p-xylene	LB068917	mg/kg	0.2	<0.2	0%	92%	87%
o-xylene	LB068917	mg/kg	0.1	<0.1	0%	88%	87%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB068917	mg/kg	0.1	<0.1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB068917	%	-	84%	3 - 9%	89%	85%
d4-1,2-dichloroethane (Surrogate)	LB068917	%	-	90%	3 - 18%	90%	99%
d8-toluene (Surrogate)	LB068917	%	-	93%	11 - 12%	97%	108%
Bromofluorobenzene (Surrogate)	LB068917	%	-	87%	5 - 7%	119%	108%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Xylenes*	LB068917	mg/kg	0.3	<0.3	0%	NA	NA
Total BTEX*	LB068917	mg/kg	0.6	<0.6	0%	NA	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.

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

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB068997	µg/L	0.5	<0.5	103%
Toluene	LB068997	µg/L	0.5	<0.5	105%
Ethylbenzene	LB068997	µg/L	0.5	<0.5	109%
m/p-xylene	LB068997	µg/L	1	<1	107%
o-xylene	LB068997	µg/L	0.5	<0.5	108%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Naphthalene	LB068997	µg/L	0.5	<0.5	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB068997	%	-	113%	90%
d4-1,2-dichloroethane (Surrogate)	LB068997	%	-	111%	89%
d8-toluene (Surrogate)	LB068997	%	-	98%	95%
Bromofluorobenzene (Surrogate)	LB068997	%	-	84%	106%

Totals

Parameter	QC Reference	Units	LOR	MB
Total Xylenes	LB068997	µg/L	1.5	<1.5
Total BTEX	LB068997	µg/L	3	<3

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	LB068917	mg/kg	25	<25	0%	98%	92%
TRH C6-C9	LB068917	mg/kg	20	<20	0%	87%	87%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB068917	%	-	84%	3 - 9%	89%	85%
d4-1,2-dichloroethane (Surrogate)	LB068917	%	-	90%	3 - 18%	90%	99%
d8-toluene (Surrogate)	LB068917	%	-	93%	11 - 12%	97%	108%
Bromofluorobenzene (Surrogate)	LB068917	%	-	87%	5 - 7%	119%	108%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB068917	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB068917	mg/kg	25	<25	0%	122%	110%

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	LB068997	µg/L	50	<50	100%
TRH C6-C9	LB068997	µg/L	40	<40	100%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB068997	%	-	113%	90%
d4-1,2-dichloroethane (Surrogate)	LB068997	%	-	111%	89%
d8-toluene (Surrogate)	LB068997	%	-	98%	95%
Bromofluorobenzene (Surrogate)	LB068997	%	-	84%	106%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene (F0)	LB068997	µg/L	0.5	<0.5	NA
TRH C6-C10 minus BTEX (F1)	LB068997	µg/L	50	<50	102%

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.
AN005	Following wet sieving of the sample,(particles smaller than 75 µm) a dispersing solution is added and a hydrometer is used to measure sedimentation. Soil density is determined and the percentage of each size fraction calculated. Referenced to AS1289.3.6.3.
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.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1 M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pretreated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is refernced to Rayment and Higginson, 1992, sections 15D3 and 15N1.-
AN188	The organic material in the soil sample is oxidised with chromic acid in the presence of excess sulphuric acid, without external heat being applied. The excess dichromate ion is determined by titration with standard ammonium iron (II) sulphate solution and the amount of oxidised material is calculated from the quantity of dichromate reduced. Referenced to NEPM 105 and AS1289.1.1.1.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, 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.
AN605	This technique gravimetrically deteremines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN605	This technique also gravimetrically deteremines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm Sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the screened fraction sample weights.
AN605	AMO = Amosite CRY = Chrysotile CRO = Crocidolite
AN605	In sofar as is trechnically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

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
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
^	Performed by outside laboratory.	-	The sample was not analysed for this analyte
		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

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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STATEMENT OF QA/QC PERFORMANCE

SE134169 R0

CLIENT DETAILS

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Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	(Not specified)
Samples	15

LABORATORY DETAILS

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SGS Reference	SE134169 R0
Report Number	0000098775
Date Reported	17 Dec 2014

COMMENTS

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

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

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

Duplicate	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	1 item
Matrix Spike	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	6 items
	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	2 items

SAMPLE SUMMARY

Sample counts by matrix	12 Soils, 3 Waters	Type of documentation received	COC
Date documentation received	5/12/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.7°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE134169 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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.5-0.6	SE134169.002	LB069122	04 Dec 2014	05 Dec 2014	01 Jan 2015	11 Dec 2014	01 Jan 2015	12 Dec 2014
TP22 0.4-0.5	SE134169.006	LB069122	04 Dec 2014	05 Dec 2014	01 Jan 2015	11 Dec 2014	01 Jan 2015	12 Dec 2014
TP23 0.9-1.0	SE134169.009	LB069122	04 Dec 2014	05 Dec 2014	01 Jan 2015	11 Dec 2014	01 Jan 2015	12 Dec 2014

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP20 0.5-0.6	SE134169.002	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP21 0.5-0.6	SE134169.004	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP22 0.4-0.5	SE134169.006	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP22 1.9-2.0	SE134169.007	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP23 0.9-1.0	SE134169.009	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014
QC 1	SE134169.012	LB069185	04 Dec 2014	05 Dec 2014	02 Jun 2015	11 Dec 2014	02 Jun 2015	12 Dec 2014

Mercury (dissolved) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
R1	SE134169.013	LB069222	04 Dec 2014	05 Dec 2014	01 Jan 2015	12 Dec 2014	01 Jan 2015	12 Dec 2014

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB069015	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP20 0.5-0.6	SE134169.002	LB069015	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB069015	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP21 0.5-0.6	SE134169.004	LB069015	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP22 0.4-0.5	SE134169.006	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP23 0.9-1.0	SE134169.009	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014
QC 1	SE134169.012	LB069016	04 Dec 2014	05 Dec 2014	01 Jan 2015	10 Dec 2014	01 Jan 2015	12 Dec 2014

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP20 0.5-0.6	SE134169.002	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP21 0.5-0.6	SE134169.004	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP22 0.4-0.5	SE134169.006	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP23 0.9-1.0	SE134169.009	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014
QC 1	SE134169.012	LB068977	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	14 Dec 2014	10 Dec 2014

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
QC 1	SE134169.012	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014

HOLDING TIME SUMMARY

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
QC 1	SE134169.012	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014

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
R1	SE134169.013	LB068894	04 Dec 2014	05 Dec 2014	11 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
QC 1	SE134169.012	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.5-0.6	SE134169.002	LB069166	04 Dec 2014	05 Dec 2014	11 Dec 2014	11 Dec 2014	12 Dec 2014	12 Dec 2014
TP22 0.4-0.5	SE134169.006	LB069166	04 Dec 2014	05 Dec 2014	11 Dec 2014	11 Dec 2014	12 Dec 2014	12 Dec 2014
TP23 0.9-1.0	SE134169.009	LB069166	04 Dec 2014	05 Dec 2014	11 Dec 2014	11 Dec 2014	12 Dec 2014	12 Dec 2014

Speciated Phenols in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014
QC 1	SE134169.012	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	11 Dec 2014

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.5-0.6	SE134169.002	LB069173	04 Dec 2014	05 Dec 2014	01 Jan 2015	11 Dec 2014	01 Jan 2015	12 Dec 2014
TP22 0.4-0.5	SE134169.006	LB069173	04 Dec 2014	05 Dec 2014	01 Jan 2015	11 Dec 2014	01 Jan 2015	12 Dec 2014
TP23 0.9-1.0	SE134169.009	LB069173	04 Dec 2014	05 Dec 2014	01 Jan 2015	11 Dec 2014	01 Jan 2015	12 Dec 2014

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
TP20 0.0-0.1	SE134169.001	LB069012	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP20 0.5-0.6	SE134169.002	LB069012	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP21 0.5-0.6	SE134169.004	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP22 0.4-0.5	SE134169.006	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP23 0.9-1.0	SE134169.009	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014
QC 1	SE134169.012	LB069013	04 Dec 2014	05 Dec 2014	02 Jun 2015	10 Dec 2014	02 Jun 2015	12 Dec 2014

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
R1	SE134169.013	LB068946	04 Dec 2014	05 Dec 2014	02 Jun 2015	09 Dec 2014	02 Jun 2015	10 Dec 2014

HOLDING TIME SUMMARY

SE134169 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
TP20 0.0-0.1	SE134169.001	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014
QC 1	SE134169.012	LB068883	04 Dec 2014	05 Dec 2014	18 Dec 2014	08 Dec 2014	17 Jan 2015	12 Dec 2014

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP20 0.0-0.1	SE134169.001	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank 1	SE134169.014	LB068997	04 Dec 2014	05 Dec 2014	11 Dec 2014	09 Dec 2014	18 Jan 2015	11 Dec 2014
Trip Spike 1	SE134169.015	LB068997	04 Dec 2014	05 Dec 2014	11 Dec 2014	09 Dec 2014	18 Jan 2015	11 Dec 2014

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
TP20 0.0-0.1	SE134169.001	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP21 0.0-0.11	SE134169.003	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP22 0.0-0.1	SE134169.005	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP23 0.0-0.1	SE134169.008	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP24 0.0-0.1	SE134169.010	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014
TP25 0.0-0.1	SE134169.011	LB068917	04 Dec 2014	05 Dec 2014	18 Dec 2014	09 Dec 2014	18 Jan 2015	12 Dec 2014

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
Trip Blank 1	SE134169.014	LB068997	04 Dec 2014	05 Dec 2014	11 Dec 2014	09 Dec 2014	18 Jan 2015	11 Dec 2014
Trip Spike 1	SE134169.015	LB068997	04 Dec 2014	05 Dec 2014	11 Dec 2014	09 Dec 2014	18 Jan 2015	11 Dec 2014

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)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	100
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	98
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	93
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	95
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	89
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	113

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	TP20 0.0-0.1	SE134169.001	%	70 - 130%	98
	TP21 0.0-0.11	SE134169.003	%	70 - 130%	86
	TP22 0.0-0.1	SE134169.005	%	70 - 130%	84
	TP23 0.0-0.1	SE134169.008	%	70 - 130%	80
	TP24 0.0-0.1	SE134169.010	%	70 - 130%	84
	TP25 0.0-0.1	SE134169.011	%	70 - 130%	90
	QC 1	SE134169.012	%	70 - 130%	82
d14-p-terphenyl (Surrogate)	TP20 0.0-0.1	SE134169.001	%	70 - 130%	106
	TP21 0.0-0.11	SE134169.003	%	70 - 130%	88
	TP22 0.0-0.1	SE134169.005	%	70 - 130%	92
	TP23 0.0-0.1	SE134169.008	%	70 - 130%	96
	TP24 0.0-0.1	SE134169.010	%	70 - 130%	90
	TP25 0.0-0.1	SE134169.011	%	70 - 130%	92
	QC 1	SE134169.012	%	70 - 130%	96
d5-nitrobenzene (Surrogate)	TP20 0.0-0.1	SE134169.001	%	70 - 130%	116
	TP21 0.0-0.11	SE134169.003	%	70 - 130%	102
	TP22 0.0-0.1	SE134169.005	%	70 - 130%	94
	TP23 0.0-0.1	SE134169.008	%	70 - 130%	94
	TP24 0.0-0.1	SE134169.010	%	70 - 130%	98
	TP25 0.0-0.1	SE134169.011	%	70 - 130%	98
	QC 1	SE134169.012	%	70 - 130%	94

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	R1	SE134169.013	%	40 - 130%	62
d14-p-terphenyl (Surrogate)	R1	SE134169.013	%	40 - 130%	86
d5-nitrobenzene (Surrogate)	R1	SE134169.013	%	40 - 130%	64

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	100
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	98
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	93
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	95
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	89
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	113

Speciated Phenols in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	TP20 0.0-0.1	SE134169.001	%	70 - 130%	83
	TP21 0.0-0.11	SE134169.003	%	70 - 130%	84
	TP22 0.0-0.1	SE134169.005	%	70 - 130%	80
	TP23 0.0-0.1	SE134169.008	%	70 - 130%	88
	TP24 0.0-0.1	SE134169.010	%	70 - 130%	75
	TP25 0.0-0.1	SE134169.011	%	70 - 130%	88
d5-phenol (Surrogate)	TP20 0.0-0.1	SE134169.001	%	50 - 130%	70
	TP21 0.0-0.11	SE134169.003	%	50 - 130%	73
	TP22 0.0-0.1	SE134169.005	%	50 - 130%	73
	TP23 0.0-0.1	SE134169.008	%	50 - 130%	75
	TP24 0.0-0.1	SE134169.010	%	50 - 130%	73
	TP25 0.0-0.1	SE134169.011	%	50 - 130%	71

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units

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

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

VOC's in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	75
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	76
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	87
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	73
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	94
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	91
d4-1,2-dichloroethane (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	85
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	84
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	92
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	84
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	74
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	72
d8-toluene (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	85
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	88
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	97
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	86
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	93
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	102
Dibromofluoromethane (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	70
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	73
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	79
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	72
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	77
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	70

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	83
	Trip Spike 1	SE134169.015	%	40 - 130%	111
d4-1,2-dichloroethane (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	111
	Trip Spike 1	SE134169.015	%	40 - 130%	91
d8-toluene (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	98
	Trip Spike 1	SE134169.015	%	40 - 130%	91
Dibromofluoromethane (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	117
	Trip Spike 1	SE134169.015	%	40 - 130%	94

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	75
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	76
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	87
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	73
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	94
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	91
d4-1,2-dichloroethane (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	85
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	84
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	92
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	84
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	74
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	72
d8-toluene (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	85
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	88
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	97
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	86
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	93
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	102
Dibromofluoromethane (Surrogate)	TP20 0.0-0.1	SE134169.001	%	60 - 130%	70
	TP21 0.0-0.11	SE134169.003	%	60 - 130%	73
	TP22 0.0-0.1	SE134169.005	%	60 - 130%	79
	TP23 0.0-0.1	SE134169.008	%	60 - 130%	72
	TP24 0.0-0.1	SE134169.010	%	60 - 130%	77
	TP25 0.0-0.1	SE134169.011	%	60 - 130%	70

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

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

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	83
d4-1,2-dichloroethane (Surrogate)	Trip Blank 1	SE134169.014	%	60 - 130%	111
d8-toluene (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	98
Dibromofluoromethane (Surrogate)	Trip Blank 1	SE134169.014	%	40 - 130%	117

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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB069222.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB069015.001	Mercury	mg/kg	0.01	<0.01
LB069016.001	Mercury	mg/kg	0.01	<0.01

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB068883.001		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)	%	-	102

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB068883.001		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)	%	-	100

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
LB068883.001	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	82
		d14-p-terphenyl (Surrogate)	%	-	112

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB068894.001		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)	%	-	82
		2-fluorobiphenyl (Surrogate)	%	-	72
		d14-p-terphenyl (Surrogate)	%	-	94

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB068883.001		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)	%	-	102

Speciated Phenols in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB068883.001		Phenol	mg/kg	0.5	<0.5
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
		2-chlorophenol	mg/kg	0.5	<0.5
		2,4-dimethylphenol	mg/kg	0.5	<0.5
		2,6-dichlorophenol	mg/kg	0.5	<0.5
		2,4-dichlorophenol	mg/kg	0.5	<0.5
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5
		2-nitrophenol	mg/kg	0.5	<0.5
		4-nitrophenol	mg/kg	1	<1
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
		Pentachlorophenol	mg/kg	0.5	<0.5
		2,4-dinitrophenol	mg/kg	2	<2
		4-chloro-3-methylphenol	mg/kg	2	<2
	Surrogates	2,4,6-Tribromophenol (Surrogate)	%	-	89
		d5-phenol (Surrogate)	%	-	97

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

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.

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB069012.001	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
	Iron, Fe	mg/kg	50	<50
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB069013.001	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
	Iron, Fe	mg/kg	50	<50
	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
LB068946.001	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
LB068883.001	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
LB068917.001	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)	%	-	84
		d4-1,2-dichloroethane (Surrogate)	%	-	90
		d8-toluene (Surrogate)	%	-	93
		Bromofluorobenzene (Surrogate)	%	-	87
	Totals	Total BTEX*	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB068997.001	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)	%	-	113
		d4-1,2-dichloroethane (Surrogate)	%	-	111
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	84

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

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

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB068917.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	84
		d4-1,2-dichloroethane (Surrogate)	%	-	90
		d8-toluene (Surrogate)	%	-	93

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB068997.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	113
		d4-1,2-dichloroethane (Surrogate)	%	-	111
		d8-toluene (Surrogate)	%	-	98
		Bromofluorobenzene (Surrogate)	%	-	84

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 %
SE134309.001	LB069222.014	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0
SE134309.006	LB069222.020	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134157.001	LB069015.014	Mercury	mg/kg	0.01	<0.05	<0.05	200	0
SE134169.004	LB069015.024	Mercury	mg/kg	0.01	0.02	0.02	200	0
SE134201.002	LB069016.014	Mercury	mg/kg	0.01	<0.01	<0.01	200	0
SE134201.011	LB069016.024	Mercury	mg/kg	0.01	0.02	0.01	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.011	LB068977.011	% Moisture	%w/w	0.5	13	15	37	12
SE134169.012	LB068977.013	% Moisture	%	0.5	12	12	38	3

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.003	LB068883.010		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	-	0.15	0.15	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134157.001	LB068883.004	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	0.1	<0.1	155	10
		Pyrene	mg/kg	0.1	0.1	<0.1	148	18
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0

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

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

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134157.001	LB068883.004		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	173	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	197	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs (as BaP TEQ)-assume results	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs (as BaP TEQ)-assume results	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs (as BaP TEQ)-assume results	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH	mg/kg	0.8	0.8	<0.8	187	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.7	0.5	30	18
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	13
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.5	30	21

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134212.001	LB068894.005		Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
			Fluorene	µg/L	0.1	<0.1	<0.1	200	0
			Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
			Anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Chrysene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.33	0.33	30	0
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.30	0.32	30	6
			d14-p-terphenyl (Surrogate)	µg/L	-	0.46	0.46	30	0

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.003	LB068883.010		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	2

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134092.002	LB069166.018	pH	pH Units	-	8.5	8.6	31	1
SE134160.001	LB069166.012	pH	pH Units	-	7.7	7.7	31	1

Speciated Phenols 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.

Speciated Phenols in Soil (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.003	LB068883.010	Phenol	mg/kg	0.5	<0.5	<0.5	200	0
		2-methyl phenol (o-cresol)	mg/kg	0.5	1.0	<0.5	133	64
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	200	0
		Total Cresol	mg/kg	1.5	<1.5	<1.5	200	0
		2-chlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2-nitrophenol	mg/kg	0.5	<0.5	<0.5	200	0
		4-nitrophenol	mg/kg	1	<1	<1	200	0
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	200	0
		Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4-dinitrophenol	mg/kg	2	<2	<2	200	0
		4-chloro-3-methylphenol	mg/kg	2	<2	<2	200	0
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.2	4.1	30	2
		d5-phenol (Surrogate)	mg/kg	-	1.5	1.5	30	2

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.002	LB069173.004	Total Organic Carbon	%w/w	0.05	0.56	0.52	24	7
SE134203.002	LB069173.009	Total Organic Carbon	%w/w	0.05	2.0	1.9630845094	18	0

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 %
SE134119.001	LB069012.014	Arsenic, As	mg/kg	3	4	<3	69	78 ③
		Cadmium, Cd	mg/kg	0.3	0.3	<0.3	130	5
		Chromium, Cr	mg/kg	0.3	26	27	32	7
		Copper, Cu	mg/kg	0.5	96	100	31	5
		Lead, Pb	mg/kg	1	39	41	33	4
		Nickel, Ni	mg/kg	0.5	10	12	35	11
		Zinc, Zn	mg/kg	0.5	120	130	32	5
SE134169.002	LB069012.024	Arsenic, As	mg/kg	3	3	<3	65	15
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	33	26	32	24
		Copper, Cu	mg/kg	0.5	13	13	34	4
		Lead, Pb	mg/kg	1	17	13	37	24
		Iron, Fe	mg/kg	50	24000	20000	30	18
		Nickel, Ni	mg/kg	0.5	8.6	8.8	36	2
		Zinc, Zn	mg/kg	0.5	28	27	37	4
SE134199.001	LB069013.014	Chromium, Cr	mg/kg	0.3	13	14	34	9
		Copper, Cu	mg/kg	0.5	36	38	31	4
		Lead, Pb	mg/kg	1	160	160	31	6
		Zinc, Zn	mg/kg	0.5	250	270	31	7
SE134201.008	LB069013.024	Arsenic, As	mg/kg	3	5	5	50	14
		Cadmium, Cd	mg/kg	0.3	<0.3	0.3	137	1
		Chromium, Cr	mg/kg	0.3	7.8	7.5	37	4
		Copper, Cu	mg/kg	0.5	21	21	32	0
		Lead, Pb	mg/kg	1	15	16	36	4
		Nickel, Ni	mg/kg	0.5	7.5	8.0	36	8
		Zinc, Zn	mg/kg	0.5	71	77	33	8

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134176.004	LB068946.019	Arsenic, As	µg/L	1	3	3	45	3
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	2	2	68	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	145	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 %
SE134176.004	LB068946.019		Zinc, Zn	µg/L	5	27	27	33	0

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134157.001	LB068883.004		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.010	LB068917.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	3.8	50	3
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	4.4	50	18
			d8-toluene (Surrogate)	mg/kg	-	4.7	5.3	50	12
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.7	5.0	50	7
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0
SE134169.011	LB068917.016	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.8	50	9
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	3.7	50	3
			d8-toluene (Surrogate)	mg/kg	-	5.1	4.6	50	11
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.6	4.3	50	5
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX*	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134169.010	LB068917.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.9	3.8	30	3
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	4.4	30	18
			d8-toluene (Surrogate)	mg/kg	-	4.7	5.3	30	12
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.7	5.0	30	7
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE134169.011	LB068917.016		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.8	30	9
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.6	3.7	30	3
			d8-toluene (Surrogate)	mg/kg	-	5.1	4.6	30	11
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.6	4.3	30	5
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069122.005	Exchangeable Sodium, Na	mg/kg	2	NA	160	80 - 120	84
	Exchangeable Potassium, K	mg/kg	2	NA	330	80 - 120	95
	Exchangeable Calcium, Ca	mg/kg	2	NA	4347	80 - 120	86
	Exchangeable Magnesium, Mg	mg/kg	2	NA	1578	80 - 120	86

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069015.002	Mercury	mg/kg	0.01	0.21	0.2	70 - 130	103
LB069016.002	Mercury	mg/kg	0.01	0.21	0.2	70 - 130	104

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068883.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	109
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	108
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	106
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	104
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	113
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	107
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.15	40 - 130	111

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068883.002		Naphthalene	mg/kg	0.1	3.9	4	60 - 140	98
		Acenaphthylene	mg/kg	0.1	4.0	4	60 - 140	100
		Acenaphthene	mg/kg	0.1	3.8	4	60 - 140	96
		Phenanthrene	mg/kg	0.1	4.4	4	60 - 140	109
		Anthracene	mg/kg	0.1	4.2	4	60 - 140	105
		Fluoranthene	mg/kg	0.1	4.4	4	60 - 140	111
		Pyrene	mg/kg	0.1	4.2	4	60 - 140	106
		Benzo(a)pyrene	mg/kg	0.1	4.2	4	60 - 140	104
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	84
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	76
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	98

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068894.002		Naphthalene	µg/L	0.1	40	40	60 - 140	101
		Acenaphthylene	µg/L	0.1	39	40	60 - 140	98
		Acenaphthene	µg/L	0.1	39	40	60 - 140	97
		Phenanthrene	µg/L	0.1	44	40	60 - 140	111
		Anthracene	µg/L	0.1	44	40	60 - 140	109
		Fluoranthene	µg/L	0.1	40	40	60 - 140	101
		Pyrene	µg/L	0.1	44	40	60 - 140	110
		Benzo(a)pyrene	µg/L	0.1	49	40	60 - 140	123
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	104
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	94
		d14-p-terphenyl (Surrogate)	µg/L	-	0.6	0.5	40 - 130	116

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068883.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	93

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069166.001	pH	pH Units	-	7.4	7.415	98 - 102	99

Speciated Phenols in Soil

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

Sample Number	Parameter	Units	LOR

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

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

Speciated Phenols in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068883.002		Phenol	mg/kg	0.5	0.9	1	70 - 130	89
		2,4-dichlorophenol	mg/kg	0.5	1.1	1	70 - 130	107
		2,4,6-trichlorophenol	mg/kg	0.5	1.1	1	70 - 130	112
		Pentachlorophenol	mg/kg	0.5	0.7	1	70 - 130	73
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.5	5	40 - 130	91
		d5-phenol (Surrogate)	mg/kg	-	1.8	2	40 - 130	90

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069173.002	Total Organic Carbon	%w/w	0.05	0.31	0.325	80 - 120	96

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 %
LB069012.002	Arsenic, As	mg/kg	3	45	50	80 - 120	91
	Cadmium, Cd	mg/kg	0.3	47	50	80 - 120	93
	Chromium, Cr	mg/kg	0.3	46	50	80 - 120	91
	Copper, Cu	mg/kg	0.5	47	50	80 - 120	93
	Lead, Pb	mg/kg	1	47	50	80 - 120	93
	Iron, Fe	mg/kg	50	<50	50	80 - 120	92
	Nickel, Ni	mg/kg	0.5	45	50	80 - 120	90
	Zinc, Zn	mg/kg	0.5	47	50	80 - 120	93
LB069013.002	Arsenic, As	mg/kg	3	45	50	80 - 120	90
	Cadmium, Cd	mg/kg	0.3	46	50	80 - 120	91
	Chromium, Cr	mg/kg	0.3	45	50	80 - 120	89
	Copper, Cu	mg/kg	0.5	46	50	80 - 120	92
	Lead, Pb	mg/kg	1	46	50	80 - 120	92
	Iron, Fe	mg/kg	50	<50	50	80 - 120	91
	Nickel, Ni	mg/kg	0.5	44	50	80 - 120	87
	Zinc, Zn	mg/kg	0.5	46	50	80 - 120	91

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068946.002	Arsenic, As	µg/L	1	18	20	80 - 120	92
	Cadmium, Cd	µg/L	0.1	19	20	80 - 120	94
	Chromium, Cr	µg/L	1	19	20	80 - 120	96
	Copper, Cu	µg/L	1	20	20	80 - 120	99
	Lead, Pb	µg/L	1	19	20	80 - 120	97
	Nickel, Ni	µg/L	1	20	20	80 - 120	98
	Zinc, Zn	µg/L	5	19	20	80 - 120	96

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068883.002		TRH C10-C14	mg/kg	20	40	40	60 - 140	100
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	100
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	83
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	40	40	60 - 140	100
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	95
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068917.002	Monocyclic	Benzene	mg/kg	0.1	2.4	2.9	60 - 140	84
	Aromatic	Toluene	mg/kg	0.1	2.5	2.9	60 - 140	86
		Ethylbenzene	mg/kg	0.1	2.5	2.9	60 - 140	86
		m/p-xylene	mg/kg	0.2	5.3	5.8	60 - 140	92
		o-xylene	mg/kg	0.1	2.5	2.9	60 - 140	88
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.5	5	60 - 140	89
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.5	5	60 - 140	90
		d8-toluene (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.9	5	60 - 140	119

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

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

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068997.002	Monocyclic Aromatic	Benzene	µg/L	0.5	47	45.45	60 - 140	103
		Toluene	µg/L	0.5	48	45.45	60 - 140	105
		Ethylbenzene	µg/L	0.5	49	45.45	60 - 140	109
		m/p-xylene	µg/L	1	97	90.9	60 - 140	107
		o-xylene	µg/L	0.5	49	45.45	60 - 140	108
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.5	5	60 - 140	90
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.4	5	60 - 140	89
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	µg/L	-	5.3	5	60 - 140	106

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068917.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	98
		TRH C6-C9	mg/kg	20	20	23.2	60 - 140	87
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.5	5	60 - 140	89
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.5	5	60 - 140	90
		d8-toluene (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.9	5	60 - 140	119
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	122

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB068997.002		TRH C6-C10	µg/L	50	940	946.63	60 - 140	100
		TRH C6-C9	µg/L	40	820	818.71	60 - 140	100
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.5	5	60 - 140	90
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.4	5	60 - 140	89
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	95
		Bromofluorobenzene (Surrogate)	µg/L	-	5.3	5	60 - 140	106
	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%
SE134169.013	LB069222.012	Mercury	mg/L	0.0001	0.0080	0.0002	0.008	98

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134092.001	LB069015.004	Mercury	mg/kg	0.01	0.18	<0.05	0.2	76
SE134169.005	LB069016.004	Mercury	mg/kg	0.01	0.21	0.02	0.2	95

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134157.002	LB068883.007		Naphthalene	mg/kg	0.1	4.4	<0.1	4	110
			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	4.6	<0.1	4	114
			Acenaphthene	mg/kg	0.1	4.3	<0.1	4	108
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	4.7	0.1	4	116
			Anthracene	mg/kg	0.1	4.9	<0.1	4	123
			Fluoranthene	mg/kg	0.1	4.8	0.2	4	117
			Pyrene	mg/kg	0.1	4.9	0.2	4	119
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.7	<0.1	4	115
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs (as BaP TEQ)-assume results	TEQ	0.2	4.7	<0.2	-	-
			Carcinogenic PAHs (as BaP TEQ)-assume results	TEQ (mg/kg)	0.3	4.8	<0.3	-	-
			Carcinogenic PAHs (as BaP TEQ)-assume results	TEQ (mg/kg)	0.2	4.8	<0.2	-	-
			Total PAH	mg/kg	0.8	37	1.1	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.6	-	106
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	90
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	-	84

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%
SE134092.001	LB069012.004	Arsenic, As	mg/kg	3	37	6	50	63 ④
		Cadmium, Cd	mg/kg	0.3	36	0.3	50	71
		Chromium, Cr	mg/kg	0.3	49	22	50	54 ④
		Copper, Cu	mg/kg	0.5	56	29	50	55 ④
		Lead, Pb	mg/kg	1	49	24	50	51 ④
		Nickel, Ni	mg/kg	0.5	39	6.7	50	64 ④
		Zinc, Zn	mg/kg	0.5	70	52	50	36 ④
SE134169.003	LB069013.004	Arsenic, As	mg/kg	3	41	<3	50	76
		Cadmium, Cd	mg/kg	0.3	41	<0.3	50	81
		Chromium, Cr	mg/kg	0.3	58	26	50	65 ④
		Copper, Cu	mg/kg	0.5	48	7.1	50	81
		Lead, Pb	mg/kg	1	54	19	50	70 ④
		Nickel, Ni	mg/kg	0.5	44	6.4	50	76
		Zinc, Zn	mg/kg	0.5	66	28	50	75

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134169.013	LB068946.004	Arsenic, As	µg/L	1	19	<1	20	93
		Cadmium, Cd	µg/L	0.1	19	<0.1	20	97
		Chromium, Cr	µg/L	1	19	<1	20	96
		Copper, Cu	µg/L	1	23	3	20	101
		Lead, Pb	µg/L	1	19	<1	20	97

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.

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

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134169.013	LB068946.004	Nickel, Ni	µg/L	1	21	<1	20	98
		Zinc, Zn	µg/L	5	34	14	20	102

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134157.001	LB068917.004	Monocyclic	Benzene	mg/kg	0.1	2.2	<0.1	2.9	74
		Aromatic	Toluene	mg/kg	0.1	2.6	<0.1	2.9	89
			Ethylbenzene	mg/kg	0.1	2.4	<0.1	2.9	82
			m/p-xylene	mg/kg	0.2	5.0	<0.2	5.8	87
			o-xylene	mg/kg	0.1	2.5	<0.1	2.9	87
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	3.8	5	85
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	4.5	5	99
			d8-toluene (Surrogate)	mg/kg	-	5.4	4.7	5	108
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.4	4.4	5	108
		Totals	Total Xylenes*	mg/kg	0.3	7.6	<0.3	-	-
			Total BTEX*	mg/kg	0.6	15	<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%
SE134157.001	LB068917.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	92
			TRH C6-C9	mg/kg	20	20	<20	23.2	87
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	3.8	5	85
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	4.5	5	99
			d8-toluene (Surrogate)	mg/kg	-	5.4	4.7	5	108
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.4	4.4	5	108
		VPH F	Benzene (F0)	mg/kg	0.1	2.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	110

MATRIX SPIKE DUPLICATES

SE134169 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.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service, available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any other holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

This test report shall not be reproduced, except in full.

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
~~140 Gladstone Street~~
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
~~Fyshwick ACT 2609~~

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required **YES** NO

Job Name: ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

~~To:~~
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1	TP20 (0.0-0.1)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
2	TP20 (0.5 - 0.6)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
3	TP21 (0.0-0.11)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
4	TP21 (0.5-0.6)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
5	TP22 (0.0-0.1)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
6	TP22 (0.4-0.5)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
	TP22 (0.9-1.0)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	Hold	
7	TP22 (1.9-2.0)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	Asbestos (WA method)	
	TP22 (2.6-2.7)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	Hold	
8	TP23 (0.0-0.1)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP23 (0.4-0.5)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	Hold	
10	TP23 (0.9-1.0)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
	TP23 (1.9-2.0)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	Hold	
Relinquished by: BK	Date: 5/11/14		Time: 3pm	Received by:			Time: 5/11/14 7:30pm	
Relinquished by:	Date:		Time:	Received by:			Time:	
Relinquished by:	Date:		Time:	Received by:			Time:	

RECEIVED
05 DEC 2014
SE134169

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
~~140 Gladstone Street~~
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
~~Fyshwick ACT 2609~~

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required **YES** NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
~~SGS~~
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
10	TP24 (0.0-0.1)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
11	TP25 (0.0 - 0.1)	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
12	QC 1	4/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
13	R1	4/12/2014	NA	1 Plastic 1 glass 500ml amber 2 BTEX Vials.	Water	ice	PAH and 8 heavy metals	
14	Trip Blank 1	2/12/2014 (date prep)	NA	1 Btex vial	Water	ice	BTEX and TRH C6-C9	
15	Trip Spike 1	2/12/2014 (date prep)	NA	1 Btex vial	Water	ice	BTEX and TRH C6-C9	

Relinquished by: BK	Date: 5/12/14		Time:	Received by: L. As	Time: 5/12/14 7.30pm
Relinquished by:	Date:		Time:	Received by:	Time:
Relinquished by:	Date:		Time:	Received by:	Time:

SGS

SE134169

Job:

	Matrix	250 JAR	125 JAR	BAG	60ml vials	100ml Metallocafe	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	1L 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
																										CP
1-12	S	1		1		1																	S1&2 MSB	SLS	S 11	Temp
13	A					1									1				2				WOA2	4	1	3.7°C
14, 15	W				2																		11	11	11	Good Order
																										Y / N
																										Clearly Labelled
																										Y / N
																										Correct Pres.
																										Y / N
																										No Head-space
																										Y / N / NA
																										Sufficient Vol
																										Y / N
																										Doc Date
																										05/12
																										Doc Type
																										COC
																										Complete Docs
																										Y / N
																										Requested TAT
																										Std

4 Soils on Hold

SAMPLE RECEIPT ADVICE

SE134169

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609
Telephone	(02) 6239 5656
Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	(Not specified)
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	Fri 5/12/2014
Report Due	Fri 12/12/2014
SGS Reference	**SE134169**

SUBMISSION DETAILS

This is to confirm that 15 samples were received on Friday 5/12/2014. Results are expected to be ready by Friday 12/12/2014. Please quote SGS reference SE134169 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	12 Soils, 3 Waters	Type of documentation received	COC
Date documentation received	5/12/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	3.7°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

Trip Spike can only be analysed for BTEX.
Clay Content - Subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.
4 soil samples have been placed on hold as per client's request. These samples will not be processed.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS , all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx as at the date of this document.
Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE134169

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	Speciated Phenols in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	TP20 0.0-0.1	28	25	11	-	18	10	12	8
002	TP20 0.5-0.6	-	-	-	1	-	-	-	-
003	TP21 0.0-0.11	28	25	11	-	18	10	12	8
005	TP22 0.0-0.1	28	25	11	-	18	10	12	8
006	TP22 0.4-0.5	-	-	-	1	-	-	-	-
008	TP23 0.0-0.1	28	25	11	-	18	10	12	8
009	TP23 0.9-1.0	-	-	-	1	-	-	-	-
010	TP24 0.0-0.1	28	25	11	-	18	10	12	8
011	TP25 0.0-0.1	28	25	11	-	18	10	12	8
012	QC 1	-	25	-	-	-	-	-	-

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

SE134169

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Clay and Fine Silt in Soil/Aggregate	Exchangeable Cations and Cation Exchange Capacity	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Moisture Content	TOC in Soil	Total Recoverable Metals in Soil by ICPOES from	VOCs in Water
001	TP20 0.0-0.1	-	-	5	1	1	-	7	-
002	TP20 0.5-0.6	1	13	5	1	1	1	8	-
003	TP21 0.0-0.11	-	-	5	1	1	-	7	-
004	TP21 0.5-0.6	-	-	5	1	1	-	7	-
005	TP22 0.0-0.1	-	-	5	1	1	-	7	-
006	TP22 0.4-0.5	1	13	5	1	1	1	8	-
007	TP22 1.9-2.0	-	-	5	-	-	-	-	-
008	TP23 0.0-0.1	-	-	5	1	1	-	7	-
009	TP23 0.9-1.0	1	13	5	1	1	1	8	-
010	TP24 0.0-0.1	-	-	5	1	1	-	7	-
011	TP25 0.0-0.1	-	-	5	1	1	-	7	-
012	QC 1	-	-	5	1	1	-	7	-
014	Trip Blank 1	-	-	-	-	-	-	-	12
015	Trip Spike 1	-	-	-	-	-	-	-	12

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

SE134169

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	Volatile Petroleum Hydrocarbons in Water
013	R1	1	22	7	-
014	Trip Blank 1	-	-	-	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 .

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

CERTIFICATE OF ANALYSIS 120574

Client:
Robson Environmental Pty Ltd
PO Box 112
Fyshwick
ACT 2609

Attention: Ben Kendon

Sample log in details:

Your Reference:	**9623, ESA**		
No. of samples:	1 Soil		
Date samples received / completed instructions received	8/12/2014	/	8/12/2014

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:	15/12/14	/	15/12/14
Date of Preliminary Report:	Not Issued		

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

PAHs in Soil		
Our Reference:	UNITS	120574-1
Your Reference	----------	QC2
Date Sampled	----------	4/12/2014
Type of sample		Soil
Date extracted	-	9/12/2014
Date analysed	-	9/12/2014
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96

Acid Extractable metals in soil		
Our Reference:	UNITS	120574-1
Your Reference	----------	QC2
Date Sampled	----------	4/12/2014
Type of sample		Soil
Date digested	-	09/12/2014
Date analysed	-	09/12/2014
Arsenic	mg/kg	8
Cadmium	mg/kg	<0.4
Chromium	mg/kg	25
Copper	mg/kg	23
Lead	mg/kg	28
Mercury	mg/kg	<0.1
Nickel	mg/kg	20
Zinc	mg/kg	62

Moisture		
Our Reference:	UNITS	120574-1
Your Reference	----------	QC2
Date Sampled	----------	4/12/2014
Type of sample		Soil
Date prepared	-	9/12/2014
Date analysed	-	10/12/2014
Moisture	%	11

Asbestos ID - soils		
Our Reference:	UNITS	120574-1
Your Reference	----------	QC2
Date Sampled	----------	4/12/2014
Type of sample		Soil
Date analysed	-	11/12/2014
Sample mass tested	g	758.81g
Sample Description	-	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected
ACM >7mm Estimation*	g	--
ACM <7mm Estimation*	g	--
FA and AF Estimation*	g	--
Total Asbestos g/kg*	g/kg	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001
FA and AF Estimation %(w/w)*	%	<0.001
Total Asb Est w/w* Note#	%	<0.001

Method ID	Methodology Summary
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** # The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light Microscopy and Dispersion Staining Techniques.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			9/12/2014	[NT]	[NT]	LCS-2	9/12/2014
Date analysed	-			09/12/2014	[NT]	[NT]	LCS-2	09/12/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	110%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	93%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	86%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	78%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	94%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-2	79%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-2	94%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	96	[NT]	[NT]	LCS-2	101%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			09/12/2014	[NT]	[NT]	LCS-2	09/12/2014
Date analysed	-			09/12/2014	[NT]	[NT]	LCS-2	09/12/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	115%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-2	110%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	114%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	113%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	106%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	103%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	109%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	110%

Report Comments:

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Asbestos ID was analysed by Approved Identifier: Lulu Guo
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

Robson ENVIRONMENTAL

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
Unit 1, 140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon

Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required
YES NO

Job Name: ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F014 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
Envirolab
12 Ashley Street
Chatswood NSW 2607

Contact:Jacinta
Phone: (02) 9910 6200
Mobile:
Fax: (02) 9910 6201
Email:
ABN: 91 004 591 664

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Jars	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1-	QC2	4/12/2014	West of dump	1 Jar Plastic bag	Soil	Ice	PAH, 8 heavy metals and asbestos (WA)	Please forward to Envirolab

Relinquished by: BK (05/12/2014)	Date: 05/12/2014		Time: 3pm	Received by: Daniel Ford.	Time: 8.12.14 @ 14:45
Relinquished by:	Date:		Time:	Received by:	Time:
Relinquished by:	Date:		Time:	Received by:	Time:

ENVIROLAB

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

Job No: 120574
Date Received: 8.12.14
Time Received: 14:45
Received by: D.F.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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:

Robson Environmental Pty Ltd
PO Box 112
Fyshwick ACT 2609

ph: 02 6239 5656
Fax: 02 6239 5669

Attention: Ben Kendon

Sample log in details:

Your reference:	**9623, ESA**
Envirolab Reference:	**120574**
Date received:	8/12/2014
Date results expected to be reported:	**15/12/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt (°C)	8.8
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

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609
Telephone	(02) 6239 5656
Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	**SY140911-1-IS**
Samples	33
Date Received	11/12/2014

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE134376 R0**
Report Number	0000099681
Date Reported	6/1/2015
Date Started	16/12/2014

COMMENTS

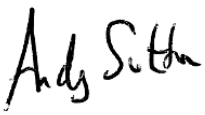
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

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

No respirable fibres detected in all soil samples using trace analysis technique as per AS 4964-2004.
Asbestos weight is approximate.
FA +AF measured gravimetrically (excluding free fibres).

Sample # 3,11: A portion of the sample supplied has been sub-sampled for asbestos according to SGS In-house procedures. We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied.
SGS Environmental Services recommends supplying approximately 50-100g of sample in a separate container.
Sample # 14 : Asbestos found in cement sheet fragment.
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES



Andy Sutton
Senior Organic Chemist



Deanne Norris
Organic Chemist



Dong Liang
Metals/Inorganics Team Leader



Huong Crawford
Production Manager



Kamrul Ahsan
Senior Chemist



Ly Kim Ha
Organic Section Head

VOC's in Soil [AN433/AN434]

PARAMETER	UOM	LOR	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
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	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025
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	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) minus	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025
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-C16 (F2)	mg/kg	25	<25
TRH >C10-C16 (F2) minus	mg/kg	25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120
TRH C10-C36 Total	mg/kg	110	<110
TRH C10-C40 Total	mg/kg	210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420]

PARAMETER	UOM	LOR	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP5 1.9-2.0 SOIL - 9/12/2014 SE134376.012	QC 3 SOIL - 9/12/2014 SE134376.014
Naphthalene	mg/kg	0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	**0.6**	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	**0.4**	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	**0.1**	<0.1	**0.3**	**0.1**	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.4**	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-	TEQ	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	**0.2**	<0.2	<0.2
Total PAH	mg/kg	0.8	<0.8	**1.5**	<0.8	**2.0**	<0.8	<0.8

PARAMETER	UOM	LOR	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025	QC5 SOIL - 10/12/2014 SE134376.030
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-	TEQ	0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2
Total PAH	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8

Speciated Phenols in Soil [AN420]

PARAMETER	UOM	LOR	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2	<2	<2

PARAMETER	UOM	LOR	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025
Phenol	mg/kg	0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
Total Cresol	mg/kg	1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5
4-nitrophenol	mg/kg	1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
Pentachlorophenol	mg/kg	0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2
4-chloro-3-methylphenol	mg/kg	2	<2

OC Pesticides in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1

PCBs in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025
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

pH in soil (1:5) [AN101]

PARAMETER	UOM	LOR	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
pH	pH Units	-	**7.5**	**6.4**	**6.0**	**6.5**	**7.3**	**6.5**

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122]

PARAMETER	UOM	LOR	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
Exchangeable Sodium, Na	mg/kg	2	18	29	24	27	140	25
Exchangeable Sodium, Na	meq/100g	0.01	0.08	0.13	0.10	0.12	0.60	0.11
Exchangeable Sodium Percentage*	%	0.1	1.0	0.9	1.0	1.0	5.1	1.0
Exchangeable Potassium, K	mg/kg	2	140	290	200	120	120	73
Exchangeable Potassium, K	meq/100g	0.01	0.35	0.73	0.51	0.30	0.31	0.19
Exchangeable Potassium	%	0.1	4.8	5.5	4.8	2.5	2.7	1.6
Exchangeable Calcium, Ca	mg/kg	2	1200	1800	1700	1200	1300	1100
Exchangeable Calcium, Ca	meq/100g	0.01	5.9	8.8	8.5	6.2	6.4	5.7
Exchangeable Calcium Percentage*	%	0.1	80.7	65.4	80.0	52.0	55.3	49.9
Exchangeable Magnesium, Mg	mg/kg	2	120	460	180	640	520	660
Exchangeable Magnesium, Mg	meq/100g	0.02	0.98	3.8	1.5	5.3	4.3	5.4
Exchangeable Magnesium	%	0.1	13.4	28.2	14.2	44.4	36.9	47.5
Cation Exchange Capacity	meq/100g	0.02	7.3	13	11	12	12	11

TOC in Soil [AN188]

PARAMETER	UOM	LOR	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
Total Organic Carbon	%w/w	0.05	**0.61**	**0.24**	**1.5**	**0.05**	**0.51**	**0.12**

Particle sizing of soils by sieving [AN005]

PARAMETER	UOM	LOR	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
Passing 75µm	%w/w	1	**33**	**69**	**52**	**50**	**69**	**35**
Retained 75µm	%w/w	1	**67**	**31**	**48**	**51**	**31**	**65**

Particle sizing of soils <75µm by hydrometer [AN005]

PARAMETER	UOM	LOR	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
Sedimentation Diameter 1	mm	0.0001	0.0574	0.0540	0.0554	0.0540	0.0533	0.0562
Passing Sedimentation Diameter 1	%w/w	1	27	49	40	49	53	35
Retained Sedimentation Diameter 1	%w/w	1	6	20	12	3	16	1
Sedimentation Diameter 2	mm	0.0001	0.0408	0.0384	0.0394	0.0387	0.0382	0.0401
Passing Sedimentation Diameter 2	%w/w	1	25	47	38	45	49	31
Retained Sedimentation Diameter 2	%w/w	1	2	2	2	4	4	3
Sedimentation Diameter 3	mm	0.0001	0.0209	0.0275	0.0280	0.0277	0.0272	0.0285
Passing Sedimentation Diameter 3	%w/w	1	24	42	36	40	46	29
Retained Sedimentation Diameter 3	%w/w	1	1	4	2	4	3	2
Sedimentation Diameter 4	mm	0.0001	0.0207	0.0196	0.0199	0.0197	0.0194	0.0203
Passing Sedimentation Diameter 4	%w/w	1	20	40	35	38	42	27
Retained Sedimentation Diameter 4	%w/w	1	3	2	1	2	3	2
Sedimentation Diameter 5	mm	0.0001	0.0152	0.0143	0.0146	0.0145	0.0143	0.0149
Passing Sedimentation Diameter 5	%w/w	1	18	39	31	36	40	25
Retained Sedimentation Diameter 5	%w/w	1	2	1	3	2	2	2
Sedimentation Diameter 6	mm	0.0001	0.0108	0.0102	0.0105	0.0103	0.0102	0.0106
Passing Sedimentation Diameter 6	%w/w	1	16	36	27	35	38	23
Retained Sedimentation Diameter 6	%w/w	1	2	3	4	1	2	2
Sedimentation Diameter 7	mm	0.0001	0.0076	0.0073	0.0075	0.0073	0.0072	0.0075
Passing Sedimentation Diameter 7	%w/w	1	16	34	24	32	38	23
Retained Sedimentation Diameter 7	%w/w	1	<1	2	3	2	<1	<1
Sedimentation Diameter 8	mm	0.0001	0.0054	0.0052	0.0053	0.0052	0.0051	0.0054
Passing Sedimentation Diameter 8	%w/w	1	15	31	23	31	37	19
Retained Sedimentation Diameter 8	%w/w	1	1	2	1	1	1	3
Sedimentation Diameter 9	mm	0.0001	0.0038	0.0037	0.0038	0.0037	0.0037	0.0038
Passing Sedimentation Diameter 9	%w/w	1	14	31	19	29	32	19
Retained Sedimentation Diameter 9	%w/w	1	1	<1	3	2	4	<1
Sedimentation Diameter 10	mm	0.0001	0.0016	0.0015	0.0015	0.0015	0.0015	0.0015
Passing Sedimentation Diameter 10	%w/w	1	14	29	18	27	31	18
Retained Sedimentation Diameter 10	%w/w	1	<1	2	1	2	1	1
Sedimentation Diameter 11	mm	0.0001	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
Passing Sedimentation Diameter 11	%w/w	1	14	27	16	25	29	16
Retained Sedimentation Diameter 11	%w/w	1	<1	2	2	2	2	2
Sedimentation Diameter 12	mm	0.0001	-	-	-	-	-	-
Passing Sedimentation Diameter 12	%w/w	1	-	-	-	-	-	-
Retained Sedimentation Diameter 12	%w/w	1	-	-	-	-	-	-

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest [AN040/AN320]

PARAMETER	UOM	LOR	TP1 0.0-0.1 SOIL - 9/12/2014 SE134376.001	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP1 1.1-1.2 SOIL - 9/12/2014 SE134376.003	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006
Arsenic, As	mg/kg	3	11	10	9	7	8	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.5	<0.3	<0.3	0.3
Chromium, Cr	mg/kg	0.3	11	10	23	19	15	40
Copper, Cu	mg/kg	0.5	28	27	72	16	19	22
Lead, Pb	mg/kg	1	25	24	57	60	24	59
Iron, Fe	mg/kg	50	-	-	-	-	15000	40000
Nickel, Ni	mg/kg	0.5	44	34	18	14	19	13
Zinc, Zn	mg/kg	0.5	160	75	230	94	130	290

PARAMETER	UOM	LOR	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP3 0.4-0.5 SOIL - 9/12/2014 SE134376.008	TP3 1.4-1.5 SOIL - 9/12/2014 SE134376.009	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 1.9-2.0 SOIL - 9/12/2014 SE134376.012
Arsenic, As	mg/kg	3	7	9	12	7	9	8
Cadmium, Cd	mg/kg	0.3	<0.3	0.5	0.4	0.4	0.5	<0.3
Chromium, Cr	mg/kg	0.3	17	21	21	18	21	18
Copper, Cu	mg/kg	0.5	30	23	69	25	51	35
Lead, Pb	mg/kg	1	24	58	470	170	70	34
Iron, Fe	mg/kg	50	-	-	-	-	-	-
Nickel, Ni	mg/kg	0.5	19	12	11	18	18	16
Zinc, Zn	mg/kg	0.5	82	290	330	260	250	270

PARAMETER	UOM	LOR	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	QC 3 SOIL - 9/12/2014 SE134376.014	TP4 0.0-0.1 SOIL - 10/12/2014 SE134376.018	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP4 1.9-2.0 SOIL - 10/12/2014 SE134376.020	TP4 3.6-3.7 SOIL - 10/12/2014 SE134376.021
Arsenic, As	mg/kg	3	3	8	5	3	10	4
Cadmium, Cd	mg/kg	0.3	<0.3	0.4	<0.3	0.7	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	30	19	26	9.2	21	15
Copper, Cu	mg/kg	0.5	13	22	9.4	8.0	25	14
Lead, Pb	mg/kg	1	22	99	50	250	110	11
Iron, Fe	mg/kg	50	30000	-	-	-	-	-
Nickel, Ni	mg/kg	0.5	12	18	6.3	4.8	16	7.5
Zinc, Zn	mg/kg	0.5	93	250	43	110	120	83

PARAMETER	UOM	LOR	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022	TP6 1.9-2.0 SOIL - 10/12/2014 SE134376.023	TP6 3.4-3.5 SOIL - 10/12/2014 SE134376.024	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
Arsenic, As	mg/kg	3	5	5	6	4	4	<3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.4	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	22	21	18	24	18	20
Copper, Cu	mg/kg	0.5	14	12	42	11	7.1	11
Lead, Pb	mg/kg	1	28	26	89	19	22	8
Iron, Fe	mg/kg	50	-	-	-	-	7600	12000
Nickel, Ni	mg/kg	0.5	14	9.3	11	7.1	5.9	10
Zinc, Zn	mg/kg	0.5	26	520	260	21	22	150

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest [AN040/AN320] (continued)

PARAMETER	UOM	LOR	QC5 SOIL - 10/12/2014 SE134376.030
Arsenic, As	mg/kg	3	**6**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	**25**
Copper, Cu	mg/kg	0.5	**10**
Lead, Pb	mg/kg	1	**28**
Iron, Fe	mg/kg	50	-
Nickel, Ni	mg/kg	0.5	**7.8**
Zinc, Zn	mg/kg	0.5	**25**

Mercury in Soil [AN312]

PARAMETER	UOM	LOR	TP1 0.0-0.1 SOIL - 9/12/2014 SE134376.001	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP1 1.1-1.2 SOIL - 9/12/2014 SE134376.003	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006
Mercury	mg/kg	0.01	<0.01	<0.01	0.40	0.03	0.03	0.02

PARAMETER	UOM	LOR	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP3 0.4-0.5 SOIL - 9/12/2014 SE134376.008	TP3 1.4-1.5 SOIL - 9/12/2014 SE134376.009	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 1.9-2.0 SOIL - 9/12/2014 SE134376.012
Mercury	mg/kg	0.01	0.01	<0.01	<0.01	0.04	0.19	0.16

PARAMETER	UOM	LOR	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	QC 3 SOIL - 9/12/2014 SE134376.014	TP4 0.0-0.1 SOIL - 10/12/2014 SE134376.018	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP4 1.9-2.0 SOIL - 10/12/2014 SE134376.020	TP4 3.6-3.7 SOIL - 10/12/2014 SE134376.021
Mercury	mg/kg	0.01	0.01	0.04	0.02	0.04	0.02	<0.01

PARAMETER	UOM	LOR	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022	TP6 1.9-2.0 SOIL - 10/12/2014 SE134376.023	TP6 3.4-3.5 SOIL - 10/12/2014 SE134376.024	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
Mercury	mg/kg	0.01	0.03	0.01	<0.01	0.02	0.02	<0.01

PARAMETER	UOM	LOR	QC5 SOIL - 10/12/2014 SE134376.030
Mercury	mg/kg	0.01	0.03

Gravimetric Determination of Asbestos in Soil [AN605]

PARAMETER	UOM	LOR	TP1 0.0-0.1 SOIL - 9/12/2014 SE134376.001	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP1 1.1-1.2 SOIL - 9/12/2014 SE134376.003	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006
Total Sample Weight*	g	1	619	640	332	630	638	610
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-	-

PARAMETER	UOM	LOR	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP3 0.4-0.5 SOIL - 9/12/2014 SE134376.008	TP3 1.4-1.5 SOIL - 9/12/2014 SE134376.009	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP5 1.9-2.0 SOIL - 9/12/2014 SE134376.012	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013
Total Sample Weight*	g	1	418	671	662	553	546	594
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-	-

PARAMETER	UOM	LOR	QC 3 SOIL - 9/12/2014 SE134376.014	TP4 0.0-0.1 SOIL - 10/12/2014 SE134376.018	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP4 1.9-2.0 SOIL - 10/12/2014 SE134376.020	TP4 3.6-3.7 SOIL - 10/12/2014 SE134376.021	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022
Total Sample Weight*	g	1	520	549	777	610	658	524
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	0.010	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	CRY	-	-	-	-	-

PARAMETER	UOM	LOR	TP6 1.9-2.0 SOIL - 10/12/2014 SE134376.023	TP6 3.4-3.5 SOIL - 10/12/2014 SE134376.024	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 2.9-3.0 SOIL - 10/12/2014 SE134376.027	TP7 3.9-4.0 SOIL - 10/12/2014 SE134376.028
Total Sample Weight*	g	1	530	613	652	675	772	596
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-	-

PARAMETER	UOM	LOR	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029	QC5 SOIL - 10/12/2014 SE134376.030
Total Sample Weight*	g	1	649	645
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-

Fibre Identification in soil [AN602]

PARAMETER	UOM	LOR	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011
Asbestos Detected	No unit	-	No
Estimated Fibres	%w/w	0.01	<0.01

Fibre ID in bulk materials [AN602]

PARAMETER	UOM	LOR	TP3 0.0-0.1 MATERIAL - 9/12/2014 SE134376.033
Asbestos Detected	No unit	-	Yes

Moisture Content [AN002]

PARAMETER	UOM	LOR	TP1 0.0-0.1 SOIL - 9/12/2014 SE134376.001	TP1 0.4-0.5 SOIL - 9/12/2014 SE134376.002	TP1 1.1-1.2 SOIL - 9/12/2014 SE134376.003	TP2 0.0-0.1 SOIL - 9/12/2014 SE134376.004	TP2 0.9-1.0 SOIL - 9/12/2014 SE134376.005	TP2 2.9-3.0 SOIL - 9/12/2014 SE134376.006
% Moisture	%	0.5	21	18	12	17	15	17

PARAMETER	UOM	LOR	TP3 0.0-0.1 SOIL - 9/12/2014 SE134376.007	TP3 0.4-0.5 SOIL - 9/12/2014 SE134376.008	TP3 1.4-1.5 SOIL - 9/12/2014 SE134376.009	TP5 0.0-0.1 SOIL - 9/12/2014 SE134376.010	TP5 1.1-1.2 SOIL - 9/12/2014 SE134376.011	TP5 1.9-2.0 SOIL - 9/12/2014 SE134376.012
% Moisture	%	0.5	16	15	15	17	12	11

PARAMETER	UOM	LOR	TP5 4.1-4.2 SOIL - 9/12/2014 SE134376.013	QC 3 SOIL - 9/12/2014 SE134376.014	TP4 0.0-0.1 SOIL - 10/12/2014 SE134376.018	TP4 0.9-1.0 SOIL - 10/12/2014 SE134376.019	TP4 1.9-2.0 SOIL - 10/12/2014 SE134376.020	TP4 3.6-3.7 SOIL - 10/12/2014 SE134376.021
% Moisture	%	0.5	12	15	16	5.1	14	7.7

PARAMETER	UOM	LOR	TP6 0.0-0.1 SOIL - 10/12/2014 SE134376.022	TP6 1.9-2.0 SOIL - 10/12/2014 SE134376.023	TP6 3.4-3.5 SOIL - 10/12/2014 SE134376.024	TP7 0.4-0.5 SOIL - 10/12/2014 SE134376.025	TP7 0.9-1.0 SOIL - 10/12/2014 SE134376.026	TP7 4.8-4.9 SOIL - 10/12/2014 SE134376.029
% Moisture	%	0.5	26	14	16	9.4	11	10

PARAMETER	UOM	LOR	QC5 SOIL - 10/12/2014 SE134376.030
% Moisture	%	0.5	15

VOCs in Water [AN433/AN434]

PARAMETER	UOM	LOR	Trip Blank 2 WATER - 9/12/2014 SE134376.016	Trip Spike 2 WATER - 8/12/2014 SE134376.017	TB3 WATER - 10/12/2014 SE134376.031	TS3 WATER - 8/12/2014 SE134376.032
Benzene	µg/L	0.5	<0.5	[104%]	<0.5	[105%]
Toluene	µg/L	0.5	<0.5	[113%]	<0.5	[111%]
Ethylbenzene	µg/L	0.5	<0.5	[113%]	<0.5	[116%]
m/p-xylene	µg/L	1	<1	[104%]	<1	[106%]
o-xylene	µg/L	0.5	<0.5	[111%]	<0.5	[113%]
Total Xylenes	µg/L	1.5	<1.5	-	<1.5	-
Total BTEX	µg/L	3	<3	-	<3	-
Naphthalene	µg/L	0.5	<0.5	-	<0.5	-

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

PARAMETER	UOM	LOR	Trip Blank 2 WATER - 9/12/2014 SE134376.016	TB3 WATER - 10/12/2014 SE134376.031
TRH C6-C9	µg/L	40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420]

PARAMETER	UOM	LOR	R2 WATER - 9/12/2014 SE134376.015
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(a&h)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1

Trace Metals (Dissolved) in Water by ICPMS [AN318]

PARAMETER	UOM	LOR	R2 WATER - 9/12/2014 SE134376.015
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Copper, Cu	µg/L	1	**4**
Chromium, Cr	µg/L	1	<1
Nickel, Ni	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Zinc, Zn	µg/L	5	**20**

Mercury (dissolved) in Water [AN311/AN312]

PARAMETER	UOM	LOR	R2 WATER - 9/12/2014 SE134376.015
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN005	The particle size distribution of a soil is determined by wet sieving, using a maximum of 900 mL of deionised water to sieve all fractions down to 75 µm. Referenced to AS1289.3.6.1 and AS1141.11.
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.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pretreated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN188	The organic material in the soil sample is oxidised with chromic acid in the presence of excess sulphuric acid , without external heat being applied. The excess dichromate ion is determined by titration with standard ammonium iron (II) sulphate solution and the amount of oxidised material is calculated from the quantity of dichromate reduced. Referenced to NEPM 105 and AS1289.1.1.1.
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.
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.
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.
AN605	This technique gravimetrically deteremines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

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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ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

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Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	**SY140911-1-IS**
Samples	33

LABORATORY DETAILS

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SGS Reference	SE134376 R0
Report Number	0000099682
Date Reported	06 Jan 2015
Date Received	11 Dec 2014

COMMENTS

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

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

No respirable fibres detected in all soil samples using trace analysis technique as per AS 4964-2004.
Asbestos weight is approximate.
FA +AF measured gravimetrically (excluding free fibres).

Sample # 3,11: A portion of the sample supplied has been sub-sampled for asbestos according to SGS In-house procedures. We therefore cannot guarantee that the sub-sample is representative of the entire sample supplied.
SGS Environmental Services recommends supplying approximately 50-100g of sample in a separate container.
Sample # 14 : Asbestos found in cement sheet fragment.
Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

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Metals/Inorganics Team Leader

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ANALYTICAL REPORT

RESULTS

Fibre Identification in soil — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE134376.011	TP5 1.1-1.2	Soil	55g Soil,clay,rocks	09 Dec 2014	No Asbestos Found	<0.01

RESULTS

Fibre ID in bulk materials — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE134376.033	TP3 0.0-0.1	Other	20x10x3mm Cement sheet fragments	09 Dec 2014	Chrysotile Asbestos Detected	

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."
AN605	This technique gravimetrically deteremines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically deteremines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm Sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the screened fraction sample weights.
AN605	AMO = Amosite CRY = Chrysotile CRO = Crocidolite
AN605	In sofar as is trechnically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

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

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STATEMENT OF QA/QC PERFORMANCE

SE134376 R0

CLIENT DETAILS

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Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	**SY140911-1-IS**
Samples	33

LABORATORY DETAILS

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SGS Reference	SE134376 R0
Report Number	0000099683
Date Reported	06 Jan 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:

Analysis Date	pH in soil (1:5)	2 items
Duplicate	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	1 item
	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	1 item
Matrix Spike	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	7 items
	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	7 items

SAMPLE SUMMARY

Sample counts by matrix	27 Soils, 5 Waters &	Type of documentation received	COC
Date documentation received	11/12/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4.6°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE134376 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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP2 0.9-1.0	SE134376.005	LB069537	09 Dec 2014	11 Dec 2014	06 Jan 2015	18 Dec 2014	06 Jan 2015	22 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069537	09 Dec 2014	11 Dec 2014	06 Jan 2015	18 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 1.1-1.2	SE134376.011	LB069537	09 Dec 2014	11 Dec 2014	06 Jan 2015	18 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069537	09 Dec 2014	11 Dec 2014	06 Jan 2015	18 Dec 2014	06 Jan 2015	22 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069537	10 Dec 2014	11 Dec 2014	07 Jan 2015	18 Dec 2014	07 Jan 2015	22 Dec 2014
TP7 4.8-4.9	SE134376.029	LB069537	10 Dec 2014	11 Dec 2014	07 Jan 2015	18 Dec 2014	07 Jan 2015	22 Dec 2014

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.0-0.1	SE134376.001	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP1 0.4-0.5	SE134376.002	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP1 1.1-1.2	SE134376.003	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP2 0.9-1.0	SE134376.005	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP3 0.4-0.5	SE134376.008	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP3 1.4-1.5	SE134376.009	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 1.1-1.2	SE134376.011	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
QC 3	SE134376.014	LB069655	09 Dec 2014	11 Dec 2014	07 Jun 2015	19 Dec 2014	07 Jun 2015	22 Dec 2014
TP4 0.0-0.1	SE134376.018	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP4 1.9-2.0	SE134376.020	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP4 3.6-3.7	SE134376.021	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP6 1.9-2.0	SE134376.023	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP6 3.4-3.5	SE134376.024	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 2.9-3.0	SE134376.027	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 3.9-4.0	SE134376.028	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 4.8-4.9	SE134376.029	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014
QC5	SE134376.030	LB069655	10 Dec 2014	11 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	22 Dec 2014

Mercury (dissolved) in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
R2	SE134376.015	LB069632	09 Dec 2014	11 Dec 2014	06 Jan 2015	19 Dec 2014	06 Jan 2015	19 Dec 2014

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.0-0.1	SE134376.001	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP1 0.4-0.5	SE134376.002	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP1 1.1-1.2	SE134376.003	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP2 0.9-1.0	SE134376.005	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP3 0.4-0.5	SE134376.008	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP3 1.4-1.5	SE134376.009	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 1.1-1.2	SE134376.011	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
QC 3	SE134376.014	LB069366	09 Dec 2014	11 Dec 2014	06 Jan 2015	16 Dec 2014	06 Jan 2015	22 Dec 2014
TP4 0.0-0.1	SE134376.018	LB069366	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069366	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP4 1.9-2.0	SE134376.020	LB069366	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014

HOLDING TIME SUMMARY

SE134376 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 in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP4 3.6-3.7	SE134376.021	LB069366	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069366	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP6 1.9-2.0	SE134376.023	LB069367	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP6 3.4-3.5	SE134376.024	LB069367	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069367	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069367	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP7 4.8-4.9	SE134376.029	LB069367	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
QC5	SE134376.030	LB069367	10 Dec 2014	11 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.0-0.1	SE134376.001	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP1 0.4-0.5	SE134376.002	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP1 1.1-1.2	SE134376.003	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP2 0.9-1.0	SE134376.005	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP3 0.4-0.5	SE134376.008	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP3 1.4-1.5	SE134376.009	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP5 1.1-1.2	SE134376.011	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
QC 3	SE134376.014	LB069403	09 Dec 2014	11 Dec 2014	23 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP4 0.0-0.1	SE134376.018	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP4 1.9-2.0	SE134376.020	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP4 3.6-3.7	SE134376.021	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP6 1.9-2.0	SE134376.023	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP6 3.4-3.5	SE134376.024	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
TP7 4.8-4.9	SE134376.029	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014
QC5	SE134376.030	LB069403	10 Dec 2014	11 Dec 2014	24 Dec 2014	16 Dec 2014	21 Dec 2014	17 Dec 2014

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.4-0.5	SE134376.002	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC 3	SE134376.014	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC5	SE134376.030	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

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
TP1 0.4-0.5	SE134376.002	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
QC 3	SE134376.014	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

HOLDING TIME SUMMARY

SE134376 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.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QC5	SE134376.030	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

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
R2	SE134376.015	LB069310	09 Dec 2014	11 Dec 2014	16 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.4-0.5	SE134376.002	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC 3	SE134376.014	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC5	SE134376.030	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP2 0.9-1.0	SE134376.005	LB069410	09 Dec 2014	11 Dec 2014	16 Dec 2014	16 Dec 2014	17 Dec 2014	17 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069410	09 Dec 2014	11 Dec 2014	16 Dec 2014	16 Dec 2014	17 Dec 2014	17 Dec 2014
TP5 1.1-1.2	SE134376.011	LB069410	09 Dec 2014	11 Dec 2014	16 Dec 2014	16 Dec 2014	17 Dec 2014	17 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069410	09 Dec 2014	11 Dec 2014	16 Dec 2014	16 Dec 2014	17 Dec 2014	17 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069427	10 Dec 2014	11 Dec 2014	17 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP7 4.8-4.9	SE134376.029	LB069427	10 Dec 2014	11 Dec 2014	17 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†

Speciated Phenols in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.4-0.5	SE134376.002	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC 3	SE134376.014	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC5	SE134376.030	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP2 0.9-1.0	SE134376.005	LB069712	09 Dec 2014	11 Dec 2014	06 Jan 2015	22 Dec 2014	06 Jan 2015	22 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069712	09 Dec 2014	11 Dec 2014	06 Jan 2015	22 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 1.1-1.2	SE134376.011	LB069712	09 Dec 2014	11 Dec 2014	06 Jan 2015	22 Dec 2014	06 Jan 2015	22 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069712	09 Dec 2014	11 Dec 2014	06 Jan 2015	22 Dec 2014	06 Jan 2015	22 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069712	10 Dec 2014	11 Dec 2014	07 Jan 2015	22 Dec 2014	07 Jan 2015	22 Dec 2014
TP7 4.8-4.9	SE134376.029	LB069712	10 Dec 2014	11 Dec 2014	07 Jan 2015	22 Dec 2014	07 Jan 2015	22 Dec 2014

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
TP1 0.0-0.1	SE134376.001	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP1 0.4-0.5	SE134376.002	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP1 1.1-1.2	SE134376.003	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP2 0.9-1.0	SE134376.005	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP2 2.9-3.0	SE134376.006	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP3 0.4-0.5	SE134376.008	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP3 1.4-1.5	SE134376.009	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014

HOLDING TIME SUMMARY

SE134376 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.

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP5 1.1-1.2	SE134376.011	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP5 4.1-4.2	SE134376.013	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
QC 3	SE134376.014	LB069505	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	22 Dec 2014
TP4 0.0-0.1	SE134376.018	LB069505	10 Dec 2014	11 Dec 2014	08 Jun 2015	17 Dec 2014	08 Jun 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069505	10 Dec 2014	11 Dec 2014	08 Jun 2015	17 Dec 2014	08 Jun 2015	22 Dec 2014
TP4 1.9-2.0	SE134376.020	LB069505	10 Dec 2014	11 Dec 2014	08 Jun 2015	17 Dec 2014	08 Jun 2015	22 Dec 2014
TP4 3.6-3.7	SE134376.021	LB069505	10 Dec 2014	11 Dec 2014	08 Jun 2015	17 Dec 2014	08 Jun 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069505	10 Dec 2014	11 Dec 2014	08 Jun 2015	17 Dec 2014	08 Jun 2015	22 Dec 2014
TP6 1.9-2.0	SE134376.023	LB069540	10 Dec 2014	11 Dec 2014	08 Jun 2015	18 Dec 2014	08 Jun 2015	22 Dec 2014
TP6 3.4-3.5	SE134376.024	LB069540	10 Dec 2014	11 Dec 2014	08 Jun 2015	18 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069540	10 Dec 2014	11 Dec 2014	08 Jun 2015	18 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 0.9-1.0	SE134376.026	LB069540	10 Dec 2014	11 Dec 2014	08 Jun 2015	18 Dec 2014	08 Jun 2015	22 Dec 2014
TP7 4.8-4.9	SE134376.029	LB069540	10 Dec 2014	11 Dec 2014	08 Jun 2015	18 Dec 2014	08 Jun 2015	22 Dec 2014
QC5	SE134376.030	LB069540	10 Dec 2014	11 Dec 2014	08 Jun 2015	18 Dec 2014	08 Jun 2015	22 Dec 2014

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
R2	SE134376.015	LB069485	09 Dec 2014	11 Dec 2014	07 Jun 2015	17 Dec 2014	07 Jun 2015	18 Dec 2014

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
TP1 0.4-0.5	SE134376.002	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP5 1.9-2.0	SE134376.012	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC 3	SE134376.014	LB069312	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC5	SE134376.030	LB069312	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP1 0.4-0.5	SE134376.002	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069296	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069296	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069296	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank 2	SE134376.016	LB069439	09 Dec 2014	11 Dec 2014	16 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014
Trip Spike 2	SE134376.017	LB069439	08 Dec 2014	11 Dec 2014	15 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014
TB3	SE134376.031	LB069439	10 Dec 2014	11 Dec 2014	17 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014
TS3	SE134376.032	LB069439	08 Dec 2014	11 Dec 2014	15 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014

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
TP1 0.4-0.5	SE134376.002	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP2 0.0-0.1	SE134376.004	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP3 0.0-0.1	SE134376.007	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP5 0.0-0.1	SE134376.010	LB069296	09 Dec 2014	11 Dec 2014	23 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP4 0.9-1.0	SE134376.019	LB069296	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP6 0.0-0.1	SE134376.022	LB069296	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014
TP7 0.4-0.5	SE134376.025	LB069296	10 Dec 2014	11 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	19 Dec 2014

Volatile Petroleum Hydrocarbons in Water

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

Sample Name	Sample No.	QC Ref

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

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

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

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
Trip Blank 2	SE134376.016	LB069439	09 Dec 2014	11 Dec 2014	16 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014
Trip Spike 2	SE134376.017	LB069439	08 Dec 2014	11 Dec 2014	15 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014
TB3	SE134376.031	LB069439	10 Dec 2014	11 Dec 2014	17 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014
TS3	SE134376.032	LB069439	08 Dec 2014	11 Dec 2014	15 Dec 2014	15 Dec 2014	24 Jan 2015	18 Dec 2014

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)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	101
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	110
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	107
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	108
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	107
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	107
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	113

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	TP1 0.4-0.5	SE134376.002	%	70 - 130%	80
	TP2 0.0-0.1	SE134376.004	%	70 - 130%	86
	TP3 0.0-0.1	SE134376.007	%	70 - 130%	80
	TP5 0.0-0.1	SE134376.010	%	70 - 130%	84
	TP5 1.9-2.0	SE134376.012	%	70 - 130%	88
	QC 3	SE134376.014	%	70 - 130%	86
	TP4 0.9-1.0	SE134376.019	%	70 - 130%	78
	TP6 0.0-0.1	SE134376.022	%	70 - 130%	74
	TP7 0.4-0.5	SE134376.025	%	70 - 130%	74
	QC5	SE134376.030	%	70 - 130%	76
d14-p-terphenyl (Surrogate)	TP1 0.4-0.5	SE134376.002	%	70 - 130%	104
	TP2 0.0-0.1	SE134376.004	%	70 - 130%	98
	TP3 0.0-0.1	SE134376.007	%	70 - 130%	108
	TP5 0.0-0.1	SE134376.010	%	70 - 130%	98
	TP5 1.9-2.0	SE134376.012	%	70 - 130%	94
	QC 3	SE134376.014	%	70 - 130%	100
	TP4 0.9-1.0	SE134376.019	%	70 - 130%	108
	TP6 0.0-0.1	SE134376.022	%	70 - 130%	108
	TP7 0.4-0.5	SE134376.025	%	70 - 130%	104
	QC5	SE134376.030	%	70 - 130%	106
d5-nitrobenzene (Surrogate)	TP1 0.4-0.5	SE134376.002	%	70 - 130%	98
	TP2 0.0-0.1	SE134376.004	%	70 - 130%	98
	TP3 0.0-0.1	SE134376.007	%	70 - 130%	100
	TP5 0.0-0.1	SE134376.010	%	70 - 130%	100
	TP5 1.9-2.0	SE134376.012	%	70 - 130%	100
	QC 3	SE134376.014	%	70 - 130%	96
	TP4 0.9-1.0	SE134376.019	%	70 - 130%	94
	TP6 0.0-0.1	SE134376.022	%	70 - 130%	90
	TP7 0.4-0.5	SE134376.025	%	70 - 130%	86
	QC5	SE134376.030	%	70 - 130%	88

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	R2	SE134376.015	%	40 - 130%	68
d14-p-terphenyl (Surrogate)	R2	SE134376.015	%	40 - 130%	100
d5-nitrobenzene (Surrogate)	R2	SE134376.015	%	40 - 130%	72

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	101
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	110
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	107
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	108
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	107
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	107
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	113

Speciated Phenols in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	TP1 0.4-0.5	SE134376.002	%	70 - 130%	83
	TP2 0.0-0.1	SE134376.004	%	70 - 130%	81
	TP3 0.0-0.1	SE134376.007	%	70 - 130%	82
	TP5 0.0-0.1	SE134376.010	%	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.

Speciated Phenols in Soil (continued)

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	TP4 0.9-1.0	SE134376.019	%	70 - 130%	84
	TP6 0.0-0.1	SE134376.022	%	70 - 130%	86
	TP7 0.4-0.5	SE134376.025	%	70 - 130%	88
d5-phenol (Surrogate)	TP1 0.4-0.5	SE134376.002	%	50 - 130%	89
	TP2 0.0-0.1	SE134376.004	%	50 - 130%	89
	TP3 0.0-0.1	SE134376.007	%	50 - 130%	75
	TP5 0.0-0.1	SE134376.010	%	50 - 130%	88
	TP4 0.9-1.0	SE134376.019	%	50 - 130%	88
	TP6 0.0-0.1	SE134376.022	%	50 - 130%	86
	TP7 0.4-0.5	SE134376.025	%	50 - 130%	73

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	72
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	72
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	77
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	72
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	77
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	72
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	77
d4-1,2-dichloroethane (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	85
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	83
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	94
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	87
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	96
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	85
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	94
d8-toluene (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	83
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	81
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	92
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	86
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	98
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	84
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	97
Dibromofluoromethane (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	76
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	75
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	76
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	70
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	79
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	77
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	76

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	87
	Trip Spike 2	SE134376.017	%	40 - 130%	106
	TB3	SE134376.031	%	40 - 130%	84
	TS3	SE134376.032	%	40 - 130%	108
d4-1,2-dichloroethane (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	100
	Trip Spike 2	SE134376.017	%	40 - 130%	94
	TB3	SE134376.031	%	40 - 130%	105
	TS3	SE134376.032	%	40 - 130%	93
d8-toluene (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	97
	Trip Spike 2	SE134376.017	%	40 - 130%	96
	TB3	SE134376.031	%	40 - 130%	99
	TS3	SE134376.032	%	40 - 130%	97
Dibromofluoromethane (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	104
	Trip Spike 2	SE134376.017	%	40 - 130%	95
	TB3	SE134376.031	%	40 - 130%	108
	TS3	SE134376.032	%	40 - 130%	94

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

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

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	72
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	72
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	77
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	72
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	77
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	72
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	77
d4-1,2-dichloroethane (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	85
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	83
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	94
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	87
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	96
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	85
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	94
d8-toluene (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	83
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	81
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	92
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	86
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	98
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	84
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	97
Dibromofluoromethane (Surrogate)	TP1 0.4-0.5	SE134376.002	%	60 - 130%	76
	TP2 0.0-0.1	SE134376.004	%	60 - 130%	75
	TP3 0.0-0.1	SE134376.007	%	60 - 130%	76
	TP5 0.0-0.1	SE134376.010	%	60 - 130%	70
	TP4 0.9-1.0	SE134376.019	%	60 - 130%	79
	TP6 0.0-0.1	SE134376.022	%	60 - 130%	77
	TP7 0.4-0.5	SE134376.025	%	60 - 130%	76

Volatile Petroleum Hydrocarbons in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	87
	TB3	SE134376.031	%	40 - 130%	84
d4-1,2-dichloroethane (Surrogate)	Trip Blank 2	SE134376.016	%	60 - 130%	100
	TB3	SE134376.031	%	60 - 130%	105
d8-toluene (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	97
	TB3	SE134376.031	%	40 - 130%	99
Dibromofluoromethane (Surrogate)	Trip Blank 2	SE134376.016	%	40 - 130%	104
	TB3	SE134376.031	%	40 - 130%	108

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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

Mercury (dissolved) in Water

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

Sample Number	Parameter	Units	LOR	Result
LB069632.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB069366.001	Mercury	mg/kg	0.01	<0.01
LB069367.001	Mercury	mg/kg	0.01	<0.01

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069312.001		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)	%	-	112

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069312.001		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)	%	-	112

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
LB069312.001	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	90
		d14-p-terphenyl (Surrogate)	%	-	114

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result
LB069310.001		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)	%	-	80
		2-fluorobiphenyl (Surrogate)	%	-	68
		d14-p-terphenyl (Surrogate)	%	-	82

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069312.001		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)	%	-	112

Speciated Phenols in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069312.001		Phenol	mg/kg	0.5	<0.5
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
		2-chlorophenol	mg/kg	0.5	<0.5
		2,4-dimethylphenol	mg/kg	0.5	<0.5
		2,6-dichlorophenol	mg/kg	0.5	<0.5
		2,4-dichlorophenol	mg/kg	0.5	<0.5
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5
		2-nitrophenol	mg/kg	0.5	<0.5
		4-nitrophenol	mg/kg	1	<1
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
		Pentachlorophenol	mg/kg	0.5	<0.5
		2,4-dinitrophenol	mg/kg	2	<2
		4-chloro-3-methylphenol	mg/kg	2	<2
	Surrogates	2,4,6-Tribromophenol (Surrogate)	%	-	85
		d5-phenol (Surrogate)	%	-	90

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

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.

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest (continued)

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

Sample Number	Parameter	Units	LOR	Result
LB069505.001	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
	Iron, Fe	mg/kg	50	<50
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB069540.001	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
	Iron, Fe	mg/kg	50	<50
	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
LB069485.001	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
LB069312.001	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
LB069296.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	82
		d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	82
	Totals	Total BTEX*	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB069439.001	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)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	103
		Bromofluorobenzene (Surrogate)	%	-	94

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

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

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069296.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	82
		d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	96

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB069439.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	99
		d8-toluene (Surrogate)	%	-	103
		Bromofluorobenzene (Surrogate)	%	-	94

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 %
SE134600.016	LB069632.017	Mercury	µg/L	0.0001	<0.0001	<0.0001	42	0

Mercury in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.010	LB069366.014	Mercury	mg/kg	0.01	0.04	0.04	154	0
SE134376.022	LB069366.024	Mercury	mg/kg	0.01	0.03	0.02	200	0
SE134396.005	LB069367.014	Mercury	mg/kg	0.01	0.01	0.01	200	0
SE134396.014	LB069367.024	Mercury	mg/kg	0.01	<0.01	<0.01	200	0

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.010	LB069403.011	% Moisture	%w/w	0.5	17	17	36	1
SE134376.023	LB069403.022	% Moisture	%	0.5	14	15	37	6
SE134376.030	LB069403.028	% Moisture	%	0.5	15	15	37	1

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.004	LB069312.006		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	0.16	30	2

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.025	LB069312.013	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0

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 %
SE134376.025	LB069312.013		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	6
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	0

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134406.002	LB069310.008		Naphthalene	µg/L	0.1	<0.1	0	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	0	200	0
			1-methylnaphthalene	µg/L	0.1	<0.1	0	200	0
			Acenaphthylene	µg/L	0.1	<0.1	0	200	0
			Acenaphthene	µg/L	0.1	<0.1	0	200	0
			Fluorene	µg/L	0.1	<0.1	0	200	0
			Phenanthrene	µg/L	0.1	<0.1	0	200	0
			Anthracene	µg/L	0.1	<0.1	0	200	0
			Fluoranthene	µg/L	0.1	<0.1	0	200	0
			Pyrene	µg/L	0.1	<0.1	0	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	0	200	0
			Chrysene	µg/L	0.1	<0.1	0	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	0	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	0	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	0	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	0	200	0
			Dibenzo(a&h)anthracene	µg/L	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.42	30	13
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.39	30	8
			d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.49	30	4

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.004	LB069312.006		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	2

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.013	LB069410.011	pH	pH Units	-	6.5	6.7	32	3
SE134396.018	LB069427.010	pH	pH Units	-	4.8	4.7	32	3

Speciated Phenols 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.

Speciated Phenols in Soil (continued)

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.010	LB069312.008	Phenol	mg/kg	0.5	<0.5	<0.5	200	0
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	200	0
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	200	0
		Total Cresol	mg/kg	1.5	<1.5	<1.5	200	0
		2-chlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2-nitrophenol	mg/kg	0.5	<0.5	<0.5	200	0
		4-nitrophenol	mg/kg	1	<1	<1	200	0
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	200	0
		Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
		2,4-dinitrophenol	mg/kg	2	<2	<2	200	0
		4-chloro-3-methylphenol	mg/kg	2	<2	<2	200	0
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.3	4.3	30	0
		d5-phenol (Surrogate)	mg/kg	-	1.8	1.8	30	1

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.006	LB069712.006	Total Organic Carbon	%w/w	0.05	0.24	0.22	36	8

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 %
SE134376.010	LB069505.014	Arsenic, As	mg/kg	3	7	7	44	5
		Cadmium, Cd	mg/kg	0.3	0.4	0.4	107	3
		Chromium, Cr	mg/kg	0.3	18	20	33	8
		Copper, Cu	mg/kg	0.5	25	25	32	0
		Lead, Pb	mg/kg	1	170	120	31	36 ④
		Nickel, Ni	mg/kg	0.5	18	18	33	2
		Zinc, Zn	mg/kg	0.5	260	260	31	1
SE134376.022	LB069505.024	Arsenic, As	mg/kg	3	5	4	53	13
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	22	22	32	4
		Copper, Cu	mg/kg	0.5	14	13	34	1
		Lead, Pb	mg/kg	1	28	20	34	32
		Nickel, Ni	mg/kg	0.5	14	11	34	20
		Zinc, Zn	mg/kg	0.5	26	26	38	2
SE134483.007	LB069540.014	Arsenic, As	mg/kg	3	<3	<3	74	43
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	10	8.6	35	15
		Copper, Cu	mg/kg	0.5	0.7	0.9	93	32
		Lead, Pb	mg/kg	1	13	8	40	41 ②
		Nickel, Ni	mg/kg	0.5	1.5	1.6	62	8
		Zinc, Zn	mg/kg	0.5	7.1	6.6	59	7
SE134580.001	LB069540.024	Arsenic, As	mg/kg	3	8	8	42	5
		Cadmium, Cd	mg/kg	0.3	0.5	0.4	93	12
		Chromium, Cr	mg/kg	0.3	13	16	33	15
		Copper, Cu	mg/kg	0.5	29	28	32	6
		Lead, Pb	mg/kg	1	77	69	31	10
		Nickel, Ni	mg/kg	0.5	21	21	32	1
		Zinc, Zn	mg/kg	0.5	340	250	31	30

Trace Metals (Dissolved) in Water by ICPMS

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134483.003	LB069485.011	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	0.1	111	17
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	2	2	66	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 %
SE134483.003	LB069485.011		Lead, Pb	µg/L	1	<1	<1	200	0
			Nickel, Ni	µg/L	1	8	7	28	1
			Zinc, Zn	µg/L	5	210	210	17	1

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134376.025	LB069312.013		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.009	LB069296.014	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.3	50	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.1	4.4	50	5
			d8-toluene (Surrogate)	mg/kg	-	4.2	4.3	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.2	50	6
		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
SE134396.032	LB069296.024	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
			Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.8	50	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	3.9	50	4
			d8-toluene (Surrogate)	mg/kg	-	3.6	3.8	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	3.8	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

VOCs in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134406.001	LB069439.011	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	0	200	0
			Toluene	µg/L	0.5	<0.5	0	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0	200	0
			m/p-xylene	µg/L	1	<1	0	200	0
			o-xylene	µg/L	0.5	<0.5	0	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	6.2	6.1	30	1
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	6.1	5.92	30	3
			d8-toluene (Surrogate)	µg/L	-	4.8	4.71	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	4.1	3.99	30	2

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.009	LB069296.014		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	4.3	30	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.1	4.4	30	5

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 %
SE134396.009	LB069296.014	Surrogates	d8-toluene (Surrogate)	mg/kg	-	4.2	4.3	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.2	30	6
		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
SE134396.032	LB069296.024		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.8	30	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	3.9	30	4
			d8-toluene (Surrogate)	mg/kg	-	3.6	3.8	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	3.8	30	2
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Volatile Petroleum Hydrocarbons in Water

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134406.001	LB069439.011		TRH C6-C10	µg/L	50	<50	0	200	0
			TRH C6-C9	µg/L	40	<40	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	6.2	6.1	30	1
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	6.1	5.92	30	3
			d8-toluene (Surrogate)	µg/L	-	4.8	4.71	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	4.1	3.99	30	2
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069537.025	Exchangeable Sodium, Na	mg/kg	2	NA	160	80 - 120	114
	Exchangeable Potassium, K	mg/kg	2	NA	330	80 - 120	102
	Exchangeable Calcium, Ca	mg/kg	2	NA	4347	80 - 120	86
	Exchangeable Magnesium, Mg	mg/kg	2	NA	1578	80 - 120	86

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069366.002	Mercury	mg/kg	0.01	0.20	0.2	70 - 130	99
LB069367.002	Mercury	mg/kg	0.01	0.19	0.2	70 - 130	97

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069312.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	106
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	104
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	97
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	100
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	107
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	106
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	100

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069312.002		Naphthalene	mg/kg	0.1	4.4	4	60 - 140	111
		Acenaphthylene	mg/kg	0.1	4.3	4	60 - 140	106
		Acenaphthene	mg/kg	0.1	4.5	4	60 - 140	112
		Phenanthrene	mg/kg	0.1	4.8	4	60 - 140	121
		Anthracene	mg/kg	0.1	4.5	4	60 - 140	112
		Fluoranthene	mg/kg	0.1	4.8	4	60 - 140	121
		Pyrene	mg/kg	0.1	4.5	4	60 - 140	112
		Benzo(a)pyrene	mg/kg	0.1	4.5	4	60 - 140	111
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96

PAH (Polynuclear Aromatic Hydrocarbons) in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069310.002		Naphthalene	µg/L	0.1	38	40	60 - 140	95
		Acenaphthylene	µg/L	0.1	33	40	60 - 140	82
		Acenaphthene	µg/L	0.1	41	40	60 - 140	102
		Phenanthrene	µg/L	0.1	48	40	60 - 140	121
		Anthracene	µg/L	0.1	38	40	60 - 140	96
		Fluoranthene	µg/L	0.1	36	40	60 - 140	91
		Pyrene	µg/L	0.1	30	40	60 - 140	75
		Benzo(a)pyrene	µg/L	0.1	43	40	60 - 140	108
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	104
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	88
		d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	100

PCBs in Soil

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069312.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	91

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069410.001	pH	pH Units	-	7.3	7.415	98 - 102	99
LB069427.001	pH	pH Units	-	7.4	7.415	98 - 102	99

Speciated Phenols in Soil

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

Sample Number	Parameter	Units	LOR

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

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

Speciated Phenols in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069312.002		Phenol	mg/kg	0.5	1.1	1	70 - 130	105
		2,4-dichlorophenol	mg/kg	0.5	0.9	1	70 - 130	92
		2,4,6-trichlorophenol	mg/kg	0.5	1.2	1	70 - 130	119
		Pentachlorophenol	mg/kg	0.5	0.9	1	70 - 130	94
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.9	5	40 - 130	99
		d5-phenol (Surrogate)	mg/kg	-	1.9	2	40 - 130	93

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069712.002	Total Organic Carbon	%w/w	0.05	0.32	0.325	80 - 120	99

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 %
LB069505.002	Arsenic, As	mg/kg	3	44	50	80 - 120	89
	Cadmium, Cd	mg/kg	0.3	47	50	80 - 120	95
	Chromium, Cr	mg/kg	0.3	47	50	80 - 120	93
	Copper, Cu	mg/kg	0.5	46	50	80 - 120	91
	Lead, Pb	mg/kg	1	47	50	80 - 120	93
	Iron, Fe	mg/kg	50	<50	50	80 - 120	93
	Nickel, Ni	mg/kg	0.5	45	50	80 - 120	90
	Zinc, Zn	mg/kg	0.5	47	50	80 - 120	93
LB069540.002	Arsenic, As	mg/kg	3	44	50	80 - 120	89
	Cadmium, Cd	mg/kg	0.3	47	50	80 - 120	95
	Chromium, Cr	mg/kg	0.3	46	50	80 - 120	93
	Copper, Cu	mg/kg	0.5	45	50	80 - 120	90
	Lead, Pb	mg/kg	1	46	50	80 - 120	92
	Iron, Fe	mg/kg	50	<50	50	80 - 120	92
	Nickel, Ni	mg/kg	0.5	45	50	80 - 120	90
	Zinc, Zn	mg/kg	0.5	47	50	80 - 120	93

Trace Metals (Dissolved) in Water by ICPMS

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069485.002	Arsenic, As	µg/L	1	20	20	80 - 120	98
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	102
	Chromium, Cr	µg/L	1	20	20	80 - 120	100
	Copper, Cu	µg/L	1	21	20	80 - 120	104
	Lead, Pb	µg/L	1	20	20	80 - 120	102
	Nickel, Ni	µg/L	1	20	20	80 - 120	102
	Zinc, Zn	µg/L	5	21	20	80 - 120	105

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069312.002		TRH C10-C14	mg/kg	20	33	40	60 - 140	83
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	88
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	90
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	34	40	60 - 140	85
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	88
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	95

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069296.002	Monocyclic	Benzene	mg/kg	0.1	2.3	2.9	60 - 140	80
	Aromatic	Toluene	mg/kg	0.1	2.3	2.9	60 - 140	78
		Ethylbenzene	mg/kg	0.1	2.5	2.9	60 - 140	86
		m/p-xylene	mg/kg	0.2	5.3	5.8	60 - 140	92
		o-xylene	mg/kg	0.1	2.5	2.9	60 - 140	88
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	85
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	5	60 - 140	95
		d8-toluene (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.8	5	60 - 140	116

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

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

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069439.002	Monocyclic Aromatic	Benzene	µg/L	0.5	44	45.45	60 - 140	96
		Toluene	µg/L	0.5	50	45.45	60 - 140	110
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	110
		m/p-xylene	µg/L	1	88	90.9	60 - 140	96
		o-xylene	µg/L	0.5	48	45.45	60 - 140	105
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.2	5	60 - 140	84
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.2	5	60 - 140	84
		d8-toluene (Surrogate)	µg/L	-	4.9	5	60 - 140	99
		Bromofluorobenzene (Surrogate)	µg/L	-	4.7	5	60 - 140	93

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069296.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	86
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	75
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	85
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	5	60 - 140	95
		d8-toluene (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.8	5	60 - 140	116
	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 %
LB069439.002		TRH C6-C10	µg/L	50	1000	946.63	60 - 140	109
		TRH C6-C9	µg/L	40	840	818.71	60 - 140	103
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.2	5	60 - 140	84
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.2	5	60 - 140	84
		d8-toluene (Surrogate)	µg/L	-	4.9	5	60 - 140	99
		Bromofluorobenzene (Surrogate)	µg/L	-	4.7	5	60 - 140	93
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	750	639.67	60 - 140	117

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.001	LB069366.004	Mercury	mg/kg	0.01	0.18	<0.01	0.2	88
SE134376.023	LB069367.004	Mercury	mg/kg	0.01	0.20	0.01	0.2	95

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%
SE134376.001	LB069505.004	Arsenic, As	mg/kg	3	39	11	50	57 ④
		Cadmium, Cd	mg/kg	0.3	34	<0.3	50	67 ④
		Chromium, Cr	mg/kg	0.3	43	11	50	64 ④
		Copper, Cu	mg/kg	0.5	51	28	50	47 ④
		Lead, Pb	mg/kg	1	56	25	50	62 ④
		Nickel, Ni	mg/kg	0.5	68	44	50	47 ④
		Zinc, Zn	mg/kg	0.5	160	160	50	7 ④
SE134376.023	LB069540.004	Arsenic, As	mg/kg	3	34	5	50	59 ④
		Cadmium, Cd	mg/kg	0.3	34	<0.3	50	68 ④
		Chromium, Cr	mg/kg	0.3	53	21	50	64 ④
		Copper, Cu	mg/kg	0.5	46	12	50	68 ④
		Lead, Pb	mg/kg	1	56	26	50	59 ④
		Nickel, Ni	mg/kg	0.5	42	9.3	50	65 ④
		Zinc, Zn	mg/kg	0.5	310	520	50	-416 ⑨

Trace Metals (Dissolved) in Water by ICPMS

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.015	LB069485.004	Arsenic, As	µg/L	1	20	<1	20	101
		Cadmium, Cd	µg/L	0.1	21	<0.1	20	104
		Chromium, Cr	µg/L	1	20	<1	20	100
		Copper, Cu	µg/L	1	25	4	20	105
		Lead, Pb	µg/L	1	21	<1	20	102
		Nickel, Ni	µg/L	1	21	<1	20	102
		Zinc, Zn	µg/L	5	40	20	20	100

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.002	LB069296.004	Monocyclic	Benzene	mg/kg	0.1	2.2	<0.1	2.9	77
		Aromatic	Toluene	mg/kg	0.1	2.2	<0.1	2.9	77
			Ethylbenzene	mg/kg	0.1	2.3	<0.1	2.9	78
			m/p-xylene	mg/kg	0.2	4.9	<0.2	5.8	84
			o-xylene	mg/kg	0.1	2.2	<0.1	2.9	77
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.8	5	77
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	4.2	5	98
			d8-toluene (Surrogate)	mg/kg	-	4.7	4.2	5	94
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	3.6	5	105
		Totals	Total Xylenes*	mg/kg	0.3	7.1	<0.3	-	-
			Total BTEX*	mg/kg	0.6	14	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.002	LB069296.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	83
			TRH C6-C9	mg/kg	20	<20	<20	23.2	81
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.8	5	77
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	4.2	5	98
			d8-toluene (Surrogate)	mg/kg	-	4.7	4.2	5	94
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	3.6	5	105
		VPH F	Benzene (F0)	mg/kg	0.1	2.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	93

MATRIX SPIKE DUPLICATES

SE134376 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.

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COC received 12/12/14 @ 7:25am

Robson ENVIRONMENTAL Occupational Hygiene Health Safety & Environmental Consulting **CHAIN OF CUSTODY FORM** **Job No.: 9623**	**From:** Robson Environmental Pty Ltd PO Box 112 Fyshwick ACT 2609 140 Gladstone Street Fyshwick ACT 2609 ABN: 55 008 660 900 Contact: Ben Kendon Phone: (02) 6239 5656 Mobile: 0437 008 278 Fax: (02) 6239 5669 Email: results@robsonenviro.com.au ben@robsonenviro.com.au	Client Information: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609 Site Address: Old Canberra Brickworks Denman Street Yarralumla ACT 2600 Sampled by: AR ESDAT Files Required YES NO Job Name: ESA Required Turnaround Time: SGS Job Ref: SY140911-1-IS 24hr; 36hr; 48hr; 72hr & **5 to 7 Days**	Doc No: EAR-F013 Revision No: 2 Date Issued: 5/11/13 Next Review Date: 05/11/15 **To:** SGS 33 Maddox Street Alexandria NSW 2015 Contact: Matthew Phone: (02) 8594 0400 Mobile: Fax: (02) 8594 0499 Email: ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1	TP1 (0.0-0.1)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
2	TP1 (0.4 - 0.5)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP1 (0.9-1.0)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
3	TP1 (1.1-1.2)	9/12/2014	East side of dump	1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
4	TP2 (0.0-0.1)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP2(0.4-0.5)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
5	TP2 (0.9-1.0)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
	TP2 (1.9-2.0)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
6	TP2 (2.9-3.0)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
7 ;33	TP3 (0.0-0.1)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
8	TP3 (0.4-0.5)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
	TP3 (0.9-1.0)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
Rem 9 12/12/14	TP3(1.4-1.5)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
Relinquished by: BK	Date: 10/12/14		Time: 3pm	Received by:			Time: 11/12/14 9.00	
Relinquished by:	Date:		Time:	Received by:			Time:	
Relinquished by:	Date:		Time:	Received by:			Time:	

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11 DEC 2014

SE134376

page 1 of 4.

Robson ENVIRONMENTAL

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
~~140 Gladstone Street~~
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
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Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
~~Fyshwick ACT 2609~~

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required
YES NO

Job Name: Stage 1 ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

SGS Job Ref: SY140911-1-IS

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
10	TP5(0.0-0.1)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP5 (0.4 - 0.5)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
11	TP5 (1.1-1.2)	9/12/2014	East side of dump	1 glass jar	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
12	TP5 (1.9-2.0)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA) and PAH	
	TP5 (3.4-3.5)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
13	TP5 (4.1-4 2)	9/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
14	QC 3	9/12/2014	West of dump	1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
15	R2	9/12/2014	NA	1 amber 500ml, 2 BTEX vials and 1 plastic	Water	ice	PAH and Heavy Metals (8)	
16	Trip Blank 2		NA	2 Btex vials	Water	ice	BTEX and TRH C6-C9	
17	Trip Spike 2	8/12/2014 (date prep)	NA	1 Btex vial	Water	ice	BTEX and TRH C6-C9	

Received 12/12/14

Relinquished by:BK	Date:10/12/14		Time:	Received by: L.As	Time:	11/12/14 9:00
Relinquished by:	Date:		Time:	Received by:	Time:	
Relinquished by:	Date:		Time:	Received by:	Time:	

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
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Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
18	TP4 (0.0-0.1)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
	TP4 (0.4 - 0.5)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
19	TP4 (0.9-1.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
20	TP4 (1.9-2.0)	10/12/2014	East side of dump	1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
	TP4 (2.9-3.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
21	TP4(3.6-3.7)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
22	TP6 (0.0-0.1)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP6 (0.4-0.5)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
	TP6 (0.9-1.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
23	TP6 (1.9-2.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
	TP6 (2.9-3.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold
24	TP6 (3.4-3.5)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
[illegible] 12/12/14	TP7(0.0-0.1)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice		Hold

Relinquished by: BK	Date: 10/12/14	Time: 3pm	Received by: [signature]	Time: 11/12/14 9:00
Relinquished by:	Date:	Time:	Received by:	Time:
Relinquished by:	Date:	Time:	Received by:	Time:

page 3 of 4.

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
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Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required **YES** NO

Job Name: ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
25	TP7 (0.4-0.5)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
26	TP7 (0.9 - 1.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
27	TP7 (2.9-3.0)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	Asbestos (WA)	
28	TP7 (3.9-4.0)	10/12/2014	East side of dump	1 plastic bag	soil	ice	Asbestos (WA)	
29	TP7(4.8.9-4.9)	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
30	QC5	10/12/2014	East side of dump	1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
31	TB3	10/12/2014	East side of dump	2 BTEX Vials	soil	ice	BTEX and TRH C6-C9	
32	TS3	prep 8/12/14	East side of dump	1 Btex vial	soil	ice	BTEX and TRH C6-C9	

Received 12/12/14

Relinquished by: BK	Date: 10/12/14		Time: 3pm	Received by:	Time: 11/12/14 5:00
Relinquished by:	Date:		Time:	Received by:	Time:
Relinquished by:	Date:		Time:	Received by:	Time:

page 4 of 4.

AU.SampleReceipt.Sydney (Sydney)

From: Ben Kendon [Ben@robsonenviro.com.au]
Sent: Monday, 22 December 2014 8:51 AM
To: AU.SampleReceipt.Sydney (Sydney)
Subject: RE: SE134376 - 9623

Emily,

Fibre ID is fine.

Thanks ,

Ben Kendon

Robson ENVIRONMENTAL

Ben Kendon
Senior Consultant
Environmental Assessment and Remediation/HMLS
BA Grad Dip Geology
Class A Asbestos Assessor (ACTPLA) License No.2006638
Phone: 02 6239 5656
Direct: 02 6171 4623
Mobile: 0437 008 278
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Web: www.robsonenviro.com.au

BEST PRACTICE CERTIFICATION ISO9001 AS4801 ISO14001 QUALITY OH&S ENVIRONMENT

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From: AU.SampleReceipt.Sydney (Sydney) [mailto:AU.SampleReceipt.Sydney@sgs.com]
Sent: Saturday, 20 December 2014 1:58 PM
To: Ben Kendon
Subject: SE134376 - 9623

Dear Ben,

TP5 1.1-1.2- jar only supplied insufficient sample for WA Asbestos analysis. Do you want just Fibre id for this sample?

Please advise as soon as possible. Thank You.

Kind Regards,

Emily Yin
Environmental Services

90 Soils

SGS

SE18437G

Job:

Matrix	250 JAR	125 JAR	BAG	100ml metal bottle	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	1L 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	40ml vial	Storage Location	Bottles Supplied By	Comment	Cooling Method
																									CP
S	1		1																			SI88-90 HSB	SGS	5-11	Temp
S			1																			SI88-90	client	-	4.6°
W				1									1				2					WO88	SGS	5-11	Good Order
W																	2					"	"	"	Y / N
W																					1	"	"	"	Clearly Labelled
M			1																						Y / N
S	1																								Correct Pres.
																									Y / N
																									No Head-space
																									Y N / NA
				12 Soils on hold																					Sufficient Vol
																									Y / N
																									Doc Date
																									Doc Type
																									Complete Docs
																									Y / N
																									Requested TAT

SAMPLE RECEIPT ADVICE

SE134376

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609
Telephone	(02) 6239 5656
Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	**SY140911-1-IS**
Samples	33

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	Thu 11/12/2014
Report Due	Mon 22/12/2014
SGS Reference	**SE134376**

SUBMISSION DETAILS

This is to confirm that 33 samples were received on Thursday 11/12/2014. Results are expected to be ready by Monday 22/12/2014. Please quote SGS reference SE134376 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	27 Soils, 5 Waters & 1 Mat	Type of documentation received	COC
Date documentation received	11/12/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4.6°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

Trip Spike can only be analysed for BTEX.
TP1(1.1-1.2), a separate portion was not supplied for Asbestos analysis. A sub-sample will be used from the bag provided.
Clay Content - Subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.
12 soil samples have been placed on hold as per client's request. These samples will not be processed.
TP5 1.1-1.2- jar only supplied insufficient sample for WA Asbestos analysis.

Fibre ID will be analysed.
This SRA cancels and supersedes the previous SRA sent due to TP5 1.1-1.2- jar only supplied insufficient sample for WA Asbestos analysis.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx as at the date of this document.
Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE134376

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	Speciated Phenols in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
002	TP1 0.4-0.5	28	25	11	-	18	10	12	8
004	TP2 0.0-0.1	28	25	11	-	18	10	12	8
005	TP2 0.9-1.0	-	-	-	1	-	-	-	-
006	TP2 2.9-3.0	-	-	-	1	-	-	-	-
007	TP3 0.0-0.1	28	25	11	-	18	10	12	8
010	TP5 0.0-0.1	28	25	11	-	18	10	12	8
011	TP5 1.1-1.2	-	-	-	1	-	-	-	-
012	TP5 1.9-2.0	-	25	-	-	-	-	-	-
013	TP5 4.1-4.2	-	-	-	1	-	-	-	-
014	QC 3	-	25	-	-	-	-	-	-
019	TP4 0.9-1.0	28	25	11	-	18	10	12	8
022	TP6 0.0-0.1	28	25	11	-	18	10	12	8

CONTINUED OVERLEAF

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

SE134376

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	Speciated Phenols in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	TP7 0.4-0.5	28	25	11	-	18	10	12	8
026	TP7 0.9-1.0	-	-	-	1	-	-	-	-
029	TP7 4.8-4.9	-	-	-	1	-	-	-	-
030	QC5	-	25	-	-	-	-	-	-

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134376

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	Fibre Identification in soil	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Particle sizing of soils <75µm by hydrometer	Particle sizing of soils by sieving	TOC in Soil	Total Recoverable Metals in Soil by ICPOES from
001	TP1 0.0-0.1	-	-	5	1	-	-	-	7
002	TP1 0.4-0.5	-	-	5	1	-	-	-	7
003	TP1 1.1-1.2	-	-	5	1	-	-	-	7
004	TP2 0.0-0.1	-	-	5	1	-	-	-	7
005	TP2 0.9-1.0	13	-	5	1	36	2	1	8
006	TP2 2.9-3.0	13	-	5	1	36	2	1	8
007	TP3 0.0-0.1	-	-	5	1	-	-	-	7
008	TP3 0.4-0.5	-	-	5	1	-	-	-	7
009	TP3 1.4-1.5	-	-	5	1	-	-	-	7
010	TP5 0.0-0.1	-	-	5	1	-	-	-	7
011	TP5 1.1-1.2	13	2	-	1	36	2	1	8
012	TP5 1.9-2.0	-	-	5	1	-	-	-	7
013	TP5 4.1-4.2	13	-	5	1	36	2	1	8
014	QC 3	-	-	5	1	-	-	-	7
018	TP4 0.0-0.1	-	-	5	1	-	-	-	7
019	TP4 0.9-1.0	-	-	5	1	-	-	-	7
020	TP4 1.9-2.0	-	-	5	1	-	-	-	7
021	TP4 3.6-3.7	-	-	5	1	-	-	-	7
022	TP6 0.0-0.1	-	-	5	1	-	-	-	7
023	TP6 1.9-2.0	-	-	5	1	-	-	-	7
024	TP6 3.4-3.5	-	-	5	1	-	-	-	7

CONTINUED OVERLEAF

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CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Particle sizing of soils <75µm by hydrometer	Particle sizing of soils by sieving	TOC in Soil	Total Recoverable Metals in Soil by ICPOES from
025	TP7 0.4-0.5	-	5	1	-	-	-	7
026	TP7 0.9-1.0	13	5	1	36	2	1	8
027	TP7 2.9-3.0	-	5	-	-	-	-	-
028	TP7 3.9-4.0	-	5	-	-	-	-	-
029	TP7 4.8-4.9	13	5	1	36	2	1	8
030	QC5	-	5	1	-	-	-	7

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134376

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Moisture Content	PAH (Polynuclear Aromatic Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	TP1 0.0-0.1	-	1	-	-	-	-
002	TP1 0.4-0.5	-	1	-	-	-	-
003	TP1 1.1-1.2	-	1	-	-	-	-
004	TP2 0.0-0.1	-	1	-	-	-	-
005	TP2 0.9-1.0	-	1	-	-	-	-
006	TP2 2.9-3.0	-	1	-	-	-	-
007	TP3 0.0-0.1	-	1	-	-	-	-
008	TP3 0.4-0.5	-	1	-	-	-	-
009	TP3 1.4-1.5	-	1	-	-	-	-
010	TP5 0.0-0.1	-	1	-	-	-	-
011	TP5 1.1-1.2	-	1	-	-	-	-
012	TP5 1.9-2.0	-	1	-	-	-	-
013	TP5 4.1-4.2	-	1	-	-	-	-
014	QC 3	-	1	-	-	-	-
015	R2	1	-	22	7	-	-
016	Trip Blank 2	-	-	-	-	12	8
017	Trip Spike 2	-	-	-	-	9	-
018	TP4 0.0-0.1	-	1	-	-	-	-
019	TP4 0.9-1.0	-	1	-	-	-	-
020	TP4 1.9-2.0	-	1	-	-	-	-
021	TP4 3.6-3.7	-	1	-	-	-	-
022	TP6 0.0-0.1	-	1	-	-	-	-
023	TP6 1.9-2.0	-	1	-	-	-	-
024	TP6 3.4-3.5	-	1	-	-	-	-

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134376

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Fibre ID in bulk materials	Moisture Content	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
025	TP7 0.4-0.5	-	1	-	-
026	TP7 0.9-1.0	-	1	-	-
029	TP7 4.8-4.9	-	1	-	-
030	QC5	-	1	-	-
031	TB3	-	-	12	8
032	TS3	-	-	9	-
033	TP3 0.0-0.1	1	-	-	-

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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 .

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

CERTIFICATE OF ANALYSIS 120901

Client:
Robson Environmental Pty Ltd
PO Box 112
Fyshwick
ACT 2609

Attention: Ben Kendon

Sample log in details:

Your Reference:	**9623**		
No. of samples:	2 soils		
Date samples received / completed instructions received	12/12/14	/	12/12/14

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:	19/12/14	/	19/12/14
Date of Preliminary Report:	Not Issued		

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	120901-1 QC4 09/12/2014 soil	120901-2 QC6 10/12/2014 soil
Date extracted	-	15/12/2014	15/12/2014
Date analysed	-	16/12/2014	16/12/2014
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96	102

Acid Extractable metals in soil			
Our Reference:	UNITS	120901-1	120901-2
Your Reference	----------	QC4	QC6
Date Sampled	----------	09/12/2014	10/12/2014
Type of sample		soil	soil
Date digested	-	16/12/2014	16/12/2014
Date analysed	-	16/12/2014	16/12/2014
Arsenic	mg/kg	6	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	19	23
Copper	mg/kg	24	11
Lead	mg/kg	120	23
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	20	13
Zinc	mg/kg	250	26

Moisture			
Our Reference:	UNITS	120901-1	120901-2
Your Reference	----------	QC4	QC6
Date Sampled	----------	09/12/2014	10/12/2014
Type of sample		soil	soil
Date prepared	-	15/12/2014	15/12/2014
Date analysed	-	16/12/2014	16/12/2014
Moisture	%	15	14

Asbestos ID - soils			
Our Reference:	UNITS	120901-1	120901-2
Your Reference	----------	QC4	QC6
Date Sampled	----------	09/12/2014	10/12/2014
Type of sample		soil	soil
Date analysed	-	18/12/2014	18/12/2014
Sample mass tested	g	469.67g	560.31g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected
ACM >7mm Estimation*	g	--	--
ACM <7mm Estimation*	g	--	--
FA and AF Estimation*	g	--	--
Total Asbestos g/kg*	g/kg	<0.1	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001	<0.001
FA and AF Estimation %(w/w)*	%	<0.001	<0.001
Total Asb Est w/w* Note#	%	<0.001	<0.001

Method ID	Methodology Summary
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** # The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light Microscopy and Dispersion Staining Techniques.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			15/12/2014	[NT]	[NT]	LCS-4	15/12/2014
Date analysed	-			15/12/2014	[NT]	[NT]	LCS-4	15/12/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	87%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	100%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	91%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	91%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	110%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	87%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-4	95%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	104	[NT]	[NT]	LCS-4	101%

Client Reference: 9623

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			16/12/2014	[NT]	[NT]	LCS-6	16/12/2014
Date analysed	-			16/12/2014	[NT]	[NT]	LCS-6	16/12/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-6	106%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-6	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	108%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	96%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-6	96%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	99%

Report Comments:

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

Robson ENVIRONMENTAL

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
Unit 1, 140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F014 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
Envirolab
12 Ashley Street
Chatswood NSW 2607

Contact: Jacinta
Phone: (02) 9910 6200
Mobile:
Fax: (02) 9910 6201
Email:
ABN: 91 004 591 664

Lab ID 120901	Sample ID	Date Sampled	Sample Location	No. of Sample Jars	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1	QC4	9/12/2014		1 jar and 1 plastic bag	Soil	Ice	PAH, 8 heavy metals and asbestos (WA)	Please forward to Envirolab
2	QC6	10/12/2014		1 jar and 1 plastic bag	Soil	Ice	PAH, 8 heavy metals and asbestos (WA)	Please forward to Envirolab
BK Revised 14/12/14.								

Relinquished by: BK ~~(05/12/2014)~~ 12/12/14 Date: ~~05/12/2014~~ 10/12/14. Time: 3pm Received by: PR 12/12/14 Time: 16.15

Relinquished by: Date: Time: Received by: Time:

Relinquished by: Date: Time: Received by: Time:

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

Job No: 120901
Date Received: 12/12/14
Time Received: 16.15
Received by: PR
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Robson ENVIRONMENTAL

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
Unit 1, 140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F014 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
Envirolab
12 Ashley Street
Chatswood NSW 2607

Contact: Jacinta
Phone: (02) 9910 6200
Mobile:
Fax: (02) 9910 6201
Email:
ABN: 91 004 591 664

Lab ID 120901	Sample ID	Date Sampled	Sample Location	No. of Sample Jars	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1	QC4	9/12/2014		1 jar and 1 plastic bag	Soil	Ice	PAH, 8 heavy metals and asbestos (WA)	Please forward to Envirolab
2	QC6	10/12/2014		1 jar and 1 plastic bag	Soil	Ice	PAH, 8 heavy metals and asbestos (WA)	Please forward to Envirolab
BK Revised 14/12/14.								

Relinquished by: BK ~~(05/12/2014)~~ 12/12/14 Date: ~~05/12/2014~~ 10/12/14. Time: 3pm Received by: PR 12/12/14 Time: 16.15

Relinquished by: Date: Time: Received by: Time:

Relinquished by: Date: Time: Received by: Time:

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

Job No: 120901
Date Received: 12/12/14
Time Received: 16.15
Received by: PR
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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:

Robson Environmental Pty Ltd
PO Box 112
Fyshwick ACT 2609

ph: 02 6239 5656
Fax: 02 6239 5669

Attention: Ben Kendon

Sample log in details:

Your reference:	**9623**
Envirolab Reference:	**120901**
Date received:	12/12/14
Date results expected to be reported:	**19/12/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	2 soils
Turnaround time requested:	Standard
Temperature on receipt (°C)	19.2
Cooling Method:	Ice
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

Robson ENVIRONMENTAL

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required **YES** NO

Job Name: Stage 1 ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

SGS Job Ref: SY140911-1-IS

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
	TP18(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP18(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
	TP19(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP19(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	Ice	Heavy metals and asbestos (WA)	
120902	QC5 7	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
1	QC6 8	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
	QC7 9	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
2	QC8 10	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
	TB4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
	TS4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
RH revised 12/12/14.								

Relinquished by:RW	Date:11/12/14		Time:	Received by: P.Rog 12/12/14	Time: 16.15	
Relinquished by:	Date:		Time:	Received by:	Time:	
Relinquished by:	Date:		Time:	Received by:	Time:	

ENVIROLAB

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

Job No: 120902

Date Received: 12/12/14
~~Time Received:~~ 16 15
Received by: PR
Temp: ~~Cool~~/Ambient
~~Cooling: Ice/Icepack~~
~~Security: Intact~~/Broken/None

Page 4 of 4

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609
Telephone	(02) 6239 5656
Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	(Not specified)
Samples	38
Date Received	12/12/2014

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE134396 R0**
Report Number	0000099677
Date Reported	6/1/2015
Date Started	17/12/2014

COMMENTS

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

Clay Content subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.
E.Coli, Faecal Coliforms and Total Coliforms subcontracted to SONIC FOOD & WATER TESTING, 31-33 Lawson Street Penrith NSW 2750, NATA Accreditation Number: 4034.

Sample # 2 : Asbestos fibre bundles found in 10x4x3mm cement sheet fragments.
Sample # 16 : Asbestos fibre bundles found in cement sheet fragments and found loose in sample.
Sample # 17 : Asbestos fibre bundles found in cement sheet fragments,fibrous insulation material and loose in sample

No respirable fibres detected in all samples using trace analysis technique as per AS 4964-2004.
Asbestos weight is approximate.
FA +AF measured gravimetrically (excluding free fibres).

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Deanne Norris
Organic Chemist

Dong Liang
Metals/Inorganics Team Leader

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Asbestos Analyst

VOC's in Soil [AN433/AN434]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**47**	<45	<45	**99**	<45	**420**
TRH C29-C36	mg/kg	45	**46**	<45	<45	**150**	<45	**270**
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) minus	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	**200**	<90	**630**
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	**250**	<110	**690**
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	**250**	<210	**690**

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	**100**	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) minus	mg/kg	25	<25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP9 2.9-3.0 SOIL - 10/12/2014 SE134396.007	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	**0.1**	**0.2**	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-	TEQ	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP 14 0.9-1.0 SOIL - 11/12/2014 SE134396.020	TP14 2.9-3.0 SOIL - 11/12/2014 SE134396.021	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	**0.9**	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	**1.6**	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**28**	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	**4.1**	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**41**	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	**29**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	**14**	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	**8.7**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**18**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**5.1**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**9.5**	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**7.3**	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	**0.8**	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**5.9**	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-	TEQ	0.2	**15**	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.3	**15**	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.2	**15**	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH	mg/kg	0.8	**170**	<0.8	<0.8	<0.8	<0.8	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] (continued)

PARAMETER	UOM	LOR	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032	QC7 SOIL - 10/12/2014 SE134396.034	QC9 SOIL - 11/12/2014 SE134396.035
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	**0.2**	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)-	TEQ	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)-	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

Speciated Phenols in Soil [AN420]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016
Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2	<2	<2

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032
Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	**1.0**	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2	<2	<2

OC Pesticides in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**1.0**
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN400/AN420] (continued)

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PCBs in Soil [AN400/AN420]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1	<1

pH in soil (1:5) [AN101]

PARAMETER	UOM	LOR	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024
pH	pH Units	-	6.2	6.0	5.5	5.2	4.8	6.2

PARAMETER	UOM	LOR	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029
pH	pH Units	-	7.2	6.7

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122]

PARAMETER	UOM	LOR	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024
Exchangeable Sodium, Na	mg/kg	2	16	27	41	8	28	75
Exchangeable Sodium, Na	meq/100g	0.01	0.07	0.12	0.18	0.04	0.12	0.33
Exchangeable Sodium Percentage*	%	0.1	0.3	1.4	3.2	0.2	1.8	4.9
Exchangeable Potassium, K	mg/kg	2	190	240	150	95	100	130
Exchangeable Potassium, K	meq/100g	0.01	0.48	0.60	0.39	0.24	0.27	0.34
Exchangeable Potassium	%	0.1	2.0	7.0	7.0	1.6	3.9	5.1
Exchangeable Calcium, Ca	mg/kg	2	4400	1200	580	2700	740	430
Exchangeable Calcium, Ca	meq/100g	0.01	22	5.8	2.9	14	3.7	2.2
Exchangeable Calcium Percentage*	%	0.1	90.4	67.5	51.8	91.2	53.7	32.4
Exchangeable Magnesium, Mg	mg/kg	2	220	250	260	130	340	470
Exchangeable Magnesium, Mg	meq/100g	0.02	1.8	2.1	2.1	1.0	2.8	3.9
Exchangeable Magnesium	%	0.1	7.4	24.2	38.1	6.9	40.6	57.6
Cation Exchange Capacity	meq/100g	0.02	25	8.6	5.6	15	6.9	6.7

PARAMETER	UOM	LOR	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029
Exchangeable Sodium, Na	mg/kg	2	15	75
Exchangeable Sodium, Na	meq/100g	0.01	0.06	0.32
Exchangeable Sodium Percentage*	%	0.1	0.2	2.4
Exchangeable Potassium, K	mg/kg	2	770	190
Exchangeable Potassium, K	meq/100g	0.01	2.0	0.48
Exchangeable Potassium	%	0.1	6.2	3.5
Exchangeable Calcium, Ca	mg/kg	2	4900	1300
Exchangeable Calcium, Ca	meq/100g	0.01	24	6.3
Exchangeable Calcium Percentage*	%	0.1	76.8	45.4
Exchangeable Magnesium, Mg	mg/kg	2	650	820
Exchangeable Magnesium, Mg	meq/100g	0.02	5.3	6.7
Exchangeable Magnesium	%	0.1	16.8	48.7
Cation Exchange Capacity	meq/100g	0.02	32	14

TOC in Soil [AN188]

PARAMETER	UOM	LOR	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024
Total Organic Carbon	%w/w	0.05	1.4	0.32	0.47	0.20	0.43	0.11

PARAMETER	UOM	LOR	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029
Total Organic Carbon	%w/w	0.05	4.4	0.18

Particle sizing of soils by sieving [AN005]

PARAMETER	UOM	LOR	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024
Passing 75µm	%w/w	1	36	81	61	40	67	66
Retained 75µm	%w/w	1	64	19	39	60	33	34

PARAMETER	UOM	LOR	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029
Passing 75µm	%w/w	1	77	69
Retained 75µm	%w/w	1	23	31

Particle sizing of soils <75µm by hydrometer [AN005]

PARAMETER	UOM	LOR	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024
Sedimentation Diameter 1	mm	0.0001	0.0574	0.0509	0.0571	0.0557	0.0548	0.0547
Passing Sedimentation Diameter 1	%w/w	1	27	69	29	38	43	45
Retained Sedimentation Diameter 1	%w/w	1	37	12	32	2	24	21
Sedimentation Diameter 2	mm	0.0001	0.0411	0.0370	0.0406	0.0399	0.0391	0.0391
Passing Sedimentation Diameter 2	%w/w	1	23	60	27	34	40	40
Retained Sedimentation Diameter 2	%w/w	1	4	9	2	4	3	4
Sedimentation Diameter 3	mm	0.0001	0.0291	0.0266	0.0289	0.0284	0.0278	0.0278
Passing Sedimentation Diameter 3	%w/w	1	21	53	25	31	38	38
Retained Sedimentation Diameter 3	%w/w	1	1	7	2	2	2	2
Sedimentation Diameter 4	mm	0.0001	0.0207	0.0190	0.0205	0.0202	0.0198	0.0198
Passing Sedimentation Diameter 4	%w/w	1	20	51	24	29	36	36
Retained Sedimentation Diameter 4	%w/w	1	1	2	1	2	2	2
Sedimentation Diameter 5	mm	0.0001	0.0152	0.0140	0.0150	0.0147	0.0146	0.0146
Passing Sedimentation Diameter 5	%w/w	1	18	47	23	29	34	34
Retained Sedimentation Diameter 5	%w/w	1	2	4	1	<1	2	2
Sedimentation Diameter 6	mm	0.0001	0.0108	0.0102	0.0106	0.0105	0.0104	0.0104
Passing Sedimentation Diameter 6	%w/w	1	16	38	21	27	31	31
Retained Sedimentation Diameter 6	%w/w	1	2	9	1	2	2	2
Sedimentation Diameter 7	mm	0.0001	0.0076	0.0072	0.0075	0.0075	0.0074	0.0074
Passing Sedimentation Diameter 7	%w/w	1	16	36	20	25	29	29
Retained Sedimentation Diameter 7	%w/w	1	<1	2	1	2	2	2
Sedimentation Diameter 8	mm	0.0001	0.0054	0.0052	0.0054	0.0053	0.0053	0.0053
Passing Sedimentation Diameter 8	%w/w	1	14	29	18	21	26	26
Retained Sedimentation Diameter 8	%w/w	1	2	7	2	3	3	3
Sedimentation Diameter 9	mm	0.0001	0.0039	0.0037	0.0038	0.0038	0.0037	0.0037
Passing Sedimentation Diameter 9	%w/w	1	13	28	18	19	26	25
Retained Sedimentation Diameter 9	%w/w	1	1	1	<1	2	<1	1
Sedimentation Diameter 10	mm	0.0001	0.0016	0.0015	0.0016	0.0016	0.0015	0.0015
Passing Sedimentation Diameter 10	%w/w	1	9	25	16	17	23	23
Retained Sedimentation Diameter 10	%w/w	1	3	3	2	2	3	2
Sedimentation Diameter 11	mm	0.0001	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011
Passing Sedimentation Diameter 11	%w/w	1	7	23	14	16	20	20
Retained Sedimentation Diameter 11	%w/w	1	2	2	2	1	2	2
Sedimentation Diameter 12	mm	0.0001	-	-	-	-	-	-
Passing Sedimentation Diameter 12	%w/w	1	-	-	-	-	-	-
Retained Sedimentation Diameter 12	%w/w	1	-	-	-	-	-	-

Particle sizing of soils <75µm by hydrometer [AN005] (continued)

PARAMETER	UOM	LOR	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029
Sedimentation Diameter 1	mm	0.0001	0.0584	0.0519
Passing Sedimentation Diameter 1	%w/w	1	20	62
Retained Sedimentation Diameter 1	%w/w	1	57	7
Sedimentation Diameter 2	mm	0.0001	0.0416	0.0371
Passing Sedimentation Diameter 2	%w/w	1	18	59
Retained Sedimentation Diameter 2	%w/w	1	2	3
Sedimentation Diameter 3	mm	0.0001	0.0296	0.0265
Passing Sedimentation Diameter 3	%w/w	1	16	56
Retained Sedimentation Diameter 3	%w/w	1	2	3
Sedimentation Diameter 4	mm	0.0001	0.0209	0.0188
Passing Sedimentation Diameter 4	%w/w	1	16	53
Retained Sedimentation Diameter 4	%w/w	1	<1	2
Sedimentation Diameter 5	mm	0.0001	0.0153	0.0138
Passing Sedimentation Diameter 5	%w/w	1	16	51
Retained Sedimentation Diameter 5	%w/w	1	<1	2
Sedimentation Diameter 6	mm	0.0001	0.0108	0.0099
Passing Sedimentation Diameter 6	%w/w	1	15	49
Retained Sedimentation Diameter 6	%w/w	1	1	2
Sedimentation Diameter 7	mm	0.0001	0.0077	0.0070
Passing Sedimentation Diameter 7	%w/w	1	14	47
Retained Sedimentation Diameter 7	%w/w	1	1	2
Sedimentation Diameter 8	mm	0.0001	0.0054	0.0050
Passing Sedimentation Diameter 8	%w/w	1	14	45
Retained Sedimentation Diameter 8	%w/w	1	<1	2
Sedimentation Diameter 9	mm	0.0001	0.0038	0.0036
Passing Sedimentation Diameter 9	%w/w	1	14	42
Retained Sedimentation Diameter 9	%w/w	1	<1	2
Sedimentation Diameter 10	mm	0.0001	0.0016	0.0015
Passing Sedimentation Diameter 10	%w/w	1	14	40
Retained Sedimentation Diameter 10	%w/w	1	<1	2
Sedimentation Diameter 11	mm	0.0001	0.0011	0.0010
Passing Sedimentation Diameter 11	%w/w	1	14	38
Retained Sedimentation Diameter 11	%w/w	1	<1	2
Sedimentation Diameter 12	mm	0.0001	-	-
Passing Sedimentation Diameter 12	%w/w	1	-	-
Retained Sedimentation Diameter 12	%w/w	1	-	-

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest [AN040/AN320]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP8 0.9-1.0 SOIL - 10/12/2014 SE134396.002	TP8 2.8-2.9 SOIL - 10/12/2014 SE134396.004	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 2.9-3.0 SOIL - 10/12/2014 SE134396.007
Arsenic, As	mg/kg	3	6	7	5	7	18	12
Cadmium, Cd	mg/kg	0.3	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	18	18	13	19	11	11
Copper, Cu	mg/kg	0.5	18	21	6.9	14	21	21
Lead, Pb	mg/kg	1	47	130	16	17	10	15
Iron, Fe	mg/kg	50	-	-	-	-	34000	-
Nickel, Ni	mg/kg	0.5	13	15	8.7	15	59	24
Zinc, Zn	mg/kg	0.5	290	470	170	41	31	110

PARAMETER	UOM	LOR	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP10 1.9-2.0 SOIL - 11/12/2014 SE134396.010	TP10 3.9-4.0 SOIL - 11/12/2014 SE134396.011	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013
Arsenic, As	mg/kg	3	6	11	14	11	6	6
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	25	12	14	14	16	32
Copper, Cu	mg/kg	0.5	16	29	18	38	9.9	12
Lead, Pb	mg/kg	1	35	23	15	22	38	38
Iron, Fe	mg/kg	50	15000	-	-	-	-	21000
Nickel, Ni	mg/kg	0.5	8.8	30	46	25	8.8	10
Zinc, Zn	mg/kg	0.5	58	84	45	91	160	30

PARAMETER	UOM	LOR	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP12 0.4-0.5 SOIL - 10/12/2014 SE134396.015	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019
Arsenic, As	mg/kg	3	7	6	9	13	4	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	2.3	0.5	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	22	15	39	28	28	36
Copper, Cu	mg/kg	0.5	47	46	35	45	15	16
Lead, Pb	mg/kg	1	480	500	140	110	32	20
Iron, Fe	mg/kg	50	-	-	-	36000	28000	-
Nickel, Ni	mg/kg	0.5	8.2	10	23	23	11	13
Zinc, Zn	mg/kg	0.5	160	150	440	450	240	43

PARAMETER	UOM	LOR	TP 14 0.9-1.0 SOIL - 11/12/2014 SE134396.020	TP14 2.9-3.0 SOIL - 11/12/2014 SE134396.021	TP14 5.4-5.5 SOIL - 11/12/2014 SE134396.022	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025
Arsenic, As	mg/kg	3	6	10	11	6	15	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	24	13	9.7	24	20	23
Copper, Cu	mg/kg	0.5	12	16	28	11	16	10
Lead, Pb	mg/kg	1	31	20	67	35	110	41
Iron, Fe	mg/kg	50	-	-	-	-	28000	-
Nickel, Ni	mg/kg	0.5	8.9	26	30	8.2	7.2	7.6
Zinc, Zn	mg/kg	0.5	38	55	90	47	70	68

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest [AN040/AN320] (continued)

PARAMETER	UOM	LOR	TP16 0.6-0.7 SOIL - 11/12/2014 SE134396.026	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 0.9-1.0 SOIL - 11/12/2014 SE134396.028	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP18 0.6-0.7 SOIL - 11/12/2014 SE134396.031
Arsenic, As	mg/kg	3	5	8	5	<3	4	5
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	20	17	18	19	24	23
Copper, Cu	mg/kg	0.5	9.2	16	15	9.7	8.6	13
Lead, Pb	mg/kg	1	41	29	27	11	33	43
Iron, Fe	mg/kg	50	-	20000	-	28000	-	-
Nickel, Ni	mg/kg	0.5	5.8	13	9.9	12	7.8	9.4
Zinc, Zn	mg/kg	0.5	36	70	42	97	73	36

PARAMETER	UOM	LOR	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032	TP19 0.6-0.7 SOIL - 11/12/2014 SE134396.033	QC7 SOIL - 10/12/2014 SE134396.034	QC9 SOIL - 11/12/2014 SE134396.035
Arsenic, As	mg/kg	3	4	5	5	11
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	29	24	17	13
Copper, Cu	mg/kg	0.5	6.4	15	8.3	28
Lead, Pb	mg/kg	1	24	16	16	22
Iron, Fe	mg/kg	50	-	-	-	-
Nickel, Ni	mg/kg	0.5	6.8	9.2	9.4	39
Zinc, Zn	mg/kg	0.5	40	29	220	46

Mercury in Soil [AN312]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP8 0.9-1.0 SOIL - 10/12/2014 SE134396.002	TP8 2.8-2.9 SOIL - 10/12/2014 SE134396.004	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 2.9-3.0 SOIL - 10/12/2014 SE134396.007
Mercury	mg/kg	0.01	0.04	0.04	<0.01	0.01	<0.01	0.02

PARAMETER	UOM	LOR	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP10 1.9-2.0 SOIL - 11/12/2014 SE134396.010	TP10 3.9-4.0 SOIL - 11/12/2014 SE134396.011	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013
Mercury	mg/kg	0.01	0.01	<0.01	<0.01	0.01	0.03	0.02

PARAMETER	UOM	LOR	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP12 0.4-0.5 SOIL - 10/12/2014 SE134396.015	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019
Mercury	mg/kg	0.01	<0.01	<0.01	0.06	0.04	<0.01	<0.01

PARAMETER	UOM	LOR	TP 14 0.9-1.0 SOIL - 11/12/2014 SE134396.020	TP14 2.9-3.0 SOIL - 11/12/2014 SE134396.021	TP14 5.4-5.5 SOIL - 11/12/2014 SE134396.022	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025
Mercury	mg/kg	0.01	0.04	0.02	<0.01	0.01	<0.01	<0.01

PARAMETER	UOM	LOR	TP16 0.6-0.7 SOIL - 11/12/2014 SE134396.026	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 0.9-1.0 SOIL - 11/12/2014 SE134396.028	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP18 0.6-0.7 SOIL - 11/12/2014 SE134396.031
Mercury	mg/kg	0.01	<0.01	0.06	0.02	0.01	0.02	<0.01

PARAMETER	UOM	LOR	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032	TP19 0.6-0.7 SOIL - 11/12/2014 SE134396.033	QC7 SOIL - 10/12/2014 SE134396.034	QC9 SOIL - 11/12/2014 SE134396.035
Mercury	mg/kg	0.01	0.01	0.05	<0.01	<0.01

Gravimetric Determination of Asbestos in Soil [AN605]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP8 0.9-1.0 SOIL - 10/12/2014 SE134396.002	TP8 1.9-2.0 SOIL - 10/12/2014 SE134396.003	TP8 2.8-2.9 SOIL - 10/12/2014 SE134396.004	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006
Total Sample Weight*	g	1	**566**	**537**	**495**	**749**	**666**	**465**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	**0.028**	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	CRY	-	-	-	-

PARAMETER	UOM	LOR	TP9 2.9-3.0 SOIL - 10/12/2014 SE134396.007	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP10 1.9-2.0 SOIL - 11/12/2014 SE134396.010	TP10 3.9-4.0 SOIL - 11/12/2014 SE134396.011	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012
Total Sample Weight*	g	1	**513**	**599**	**875**	**696**	**724**	**368**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-	-

PARAMETER	UOM	LOR	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP12 0.4-0.5 SOIL - 10/12/2014 SE134396.015	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018
Total Sample Weight*	g	1	**605**	**744**	**493**	**440**	**590**	**527**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	**5.7**	**0.046**	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	**0.37**	**0.053**	<0.001
Fibre Type*	No unit	-	-	-	-	CRY,AMO,CRO	CRY,AMO,CRO	-

PARAMETER	UOM	LOR	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019	TP 14 0.9-1.0 SOIL - 11/12/2014 SE134396.020	TP14 2.9-3.0 SOIL - 11/12/2014 SE134396.021	TP14 5.4-5.5 SOIL - 11/12/2014 SE134396.022	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024
Total Sample Weight*	g	1	**570**	**853**	**977**	**652**	**459**	**606**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-	-

PARAMETER	UOM	LOR	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025	TP16 0.6-0.7 SOIL - 11/12/2014 SE134396.026	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 0.9-1.0 SOIL - 11/12/2014 SE134396.028	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030
Total Sample Weight*	g	1	**424**	**698**	**472**	**594**	**650**	**621**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-	-

Gravimetric Determination of Asbestos in Soil [AN605] (continued)

PARAMETER	UOM	LOR	TP18 0.6-0.7 SOIL - 11/12/2014 SE134396.031	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032	TP19 0.6-0.7 SOIL - 11/12/2014 SE134396.033	QC7 SOIL - 10/12/2014 SE134396.034	QC9 SOIL - 11/12/2014 SE134396.035
Total Sample Weight*	g	1	**615**	**618**	**637**	**728**	**669**
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type*	No unit	-	-	-	-	-	-

Fibre ID in bulk materials [AN602]

PARAMETER	UOM	LOR	TP9 0.0-0.1 MATERIAL - 10/12/2014 SE134396.038
Asbestos Detected	No unit	-	Yes

Moisture Content [AN002]

PARAMETER	UOM	LOR	TP8 0.0-0.1 SOIL - 10/12/2014 SE134396.001	TP8 0.9-1.0 SOIL - 10/12/2014 SE134396.002	TP8 2.8-2.9 SOIL - 10/12/2014 SE134396.004	TP9 0.0-0.1 SOIL - 10/12/2014 SE134396.005	TP9 1.1-1.2 SOIL - 10/12/2014 SE134396.006	TP9 2.9-3.0 SOIL - 10/12/2014 SE134396.007
% Moisture	%	0.5	15	18	8.7	13	16	24

PARAMETER	UOM	LOR	TP9 3.9-4.0 SOIL - 10/12/2014 SE134396.008	TP10 0.4-0.5 SOIL - 11/12/2014 SE134396.009	TP10 1.9-2.0 SOIL - 11/12/2014 SE134396.010	TP10 3.9-4.0 SOIL - 11/12/2014 SE134396.011	TP11 0.0-0.1 SOIL - 11/12/2014 SE134396.012	TP11 0.4-0.5 SOIL - 11/12/2014 SE134396.013
% Moisture	%	0.5	16	5.9	8.6	8.7	33	16

PARAMETER	UOM	LOR	TP12 0.0-0.1 SOIL - 10/12/2014 SE134396.014	TP12 0.4-0.5 SOIL - 10/12/2014 SE134396.015	TP13 0.0-0.1 SOIL - 11/12/2014 SE134396.016	TP13 1.9-2.0 SOIL - 11/12/2014 SE134396.017	TP13 3.5-3.6 SOIL - 11/12/2014 SE134396.018	TP14 0.0-0.1 SOIL - 11/12/2014 SE134396.019
% Moisture	%	0.5	18	21	29	12	18	18

PARAMETER	UOM	LOR	TP 14 0.9-1.0 SOIL - 11/12/2014 SE134396.020	TP14 2.9-3.0 SOIL - 11/12/2014 SE134396.021	TP14 5.4-5.5 SOIL - 11/12/2014 SE134396.022	TP15 0.0-0.1 SOIL - 10/12/2014 SE134396.023	TP15 0.9-1.0 SOIL - 10/12/2014 SE134396.024	TP16 0.0-0.1 SOIL - 11/12/2014 SE134396.025
% Moisture	%	0.5	11	7.9	6.9	34	15	23

PARAMETER	UOM	LOR	TP16 0.6-0.7 SOIL - 11/12/2014 SE134396.026	TP17 0.0-0.1 SOIL - 11/12/2014 SE134396.027	TP17 0.9-1.0 SOIL - 11/12/2014 SE134396.028	TP17 2.9-3.0 SOIL - 11/12/2014 SE134396.029	TP18 0.0-0.1 SOIL - 11/12/2014 SE134396.030	TP18 0.6-0.7 SOIL - 11/12/2014 SE134396.031
% Moisture	%	0.5	9.8	30	9.7	14	16	13

PARAMETER	UOM	LOR	TP19 0.0-0.1 SOIL - 11/12/2014 SE134396.032	TP19 0.6-0.7 SOIL - 11/12/2014 SE134396.033	QC7 SOIL - 10/12/2014 SE134396.034	QC9 SOIL - 11/12/2014 SE134396.035
% Moisture	%	0.5	19	16	14	7.5

Sample Subcontracted []

PARAMETER	UOM	LOR	TP8 2.8-2.9 SOIL - 10/12/2014 SE134396.004
Sample Subcontracted*	No unit	-	SUBCONTRACTED

VOCs in Water [AN433/AN434]

PARAMETER	UOM	LOR	TB4 WATER - 11/12/2014 SE134396.036	TS4 WATER - 11/12/2014 SE134396.037
Benzene	µg/L	0.5	<0.5	[112%]
Toluene	µg/L	0.5	<0.5	[105%]
Ethylbenzene	µg/L	0.5	<0.5	[111%]
m/p-xylene	µg/L	1	<1	[114%]
o-xylene	µg/L	0.5	<0.5	[113%]
Total Xylenes	µg/L	1.5	<1.5	-
Total BTEX	µg/L	3	<3	-
Naphthalene	µg/L	0.5	<0.5	-

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

PARAMETER	UOM	LOR	TB4 WATER - 11/12/2014 SE134396.036
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

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.
AN005	The particle size distribution of a soil is determined by wet sieving, using a maximum of 900 mL of deionised water to sieve all fractions down to 75 µm. Referenced to AS1289.3.6.1 and AS1141.11.
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.
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.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pretreated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN188	The organic material in the soil sample is oxidised with chromic acid in the presence of excess sulphuric acid, without external heat being applied. The excess dichromate ion is determined by titration with standard ammonium iron (II) sulphate solution and the amount of oxidised material is calculated from the quantity of dichromate reduced. Referenced to NEPM 105 and AS1289.1.1.1.
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
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.
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.
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.
AN605	This technique gravimetrically deteremines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.

FOOTNOTES

*	Analysis not covered by the scope of accreditation.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		
^	Performed by outside laboratory.				

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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ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
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Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	(Not specified)
Samples	38

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	SE134396 R0
Report Number	0000099678
Date Reported	06 Jan 2015
Date Received	12 Dec 2014

COMMENTS

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

Clay Content subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.
E.Coli, Faecal Coliforms and Total Coliforms subcontracted to SONIC FOOD & WATER TESTING, 31-33 Lawson Street Penrith NSW 2750, NATA Accreditation Number: 4034.

Sample # 2 : Asbestos fibre bundles found in 10x4x3mm cement sheet fragments.
Sample # 16 : Asbestos fibre bundles found in cement sheet fragments and found loose in sample.
Sample # 17 : Asbestos fibre bundles found in cement sheet fragments,fibrous insulation material and loose in sample

No respirable fibres detected in all samples using trace analysis technique as per AS 4964-2004.
Asbestos weight is approximate.
FA +AF measured gravimetrically (excluding free fibres).

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Deanne Norris
Organic Chemist

Dong Liang
Metals/Inorganics Team Leader

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Asbestos Analyst

ANALYTICAL REPORT

RESULTS

Fibre ID in bulk materials — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification	Est.%w/w
SE134396.038	TP9 0.0-0.1	Other	100x60x5mm Cement sheet fragments	10 Dec 2014	Amosite, Chrysotile & Crocidolite Asbestos Detected	

METHOD SUMMARY

SE134396 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).
AN605	This technique gravimetrically deteremines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically deteremines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm Sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the screened fraction sample weights.
AN605	AMO = Amosite CRY = Chrysotile CRO = Crocidolite
AN605	In sofar as is trechnically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

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

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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MICROBIOLOGY FINAL REPORT

SONIC FOOD & WATER TESTING

CERTIFICATE OF ANALYSIS

W1417906
[]

S.G.S AUSTRALIA PTY LTD
ALEX STENTA
U16/33 MADDOX STREET
ALEXANDRIA NSW 2015

Lab Number:	264505349
Customer Reference Number:	1220
Site:	N134396.004
Sample Type:	SOIL
Sample Notes:	
Date and Time of Collection:	Unknown,0000
Date and Time of Testing:	13/12/14,0700
Collected By:	The Client
Tested:	As Received

TESTS	RESULTS	UNITS
FAECAL COLIFORM COUNT:	Less than 200	most probable number per 100gram
ESCHERICHIA COLI COUNT:	Less than 200	most probable number per 100gram
ESCHERICHIA COLI NOT DETECTED BY THE METHOD		
TOTAL COLIFORM COUNT:	200	most probable number per 100gram

METHODS

* Total Coliforms - Sonic Food and Water Testing in-house Most Probable Number Method WT18-2008.
* Faecal Coliform - Sonic Food and Water Testing in-house Most Probable Number Method WT19-2008.
* Escherichia coli - Sonic Food and Water Testing in-house Most Probable Number method WT19-2008.

The time between sampling and the commencement of testing should not exceed 24 hours.

Signed:. . . . . RB Date:06/01/15

T.Morgan Laboratory Manager; T.Shetty Quality Manager; H.Sialepis Technical Officer; L.Vanhoff Technical Officer; K.McClenahan Scientific Officer; M.Lee Scientific Officer; P.Campora Scientific Officer; R.Bhatt Scientific Officer

NATA ACCREDITED FOR TECHNICAL COMPETENCE

Accreditation No. 4034

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STATEMENT OF QA/QC PERFORMANCE

SE134396 R0

CLIENT DETAILS

Contact	Ben Kendon
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Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE134396 R0
Report Number	0000099679
Date Reported	06 Jan 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:

Analysis Date	pH in soil (1:5)	8 items
Duplicate	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	1 item
Matrix Spike	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	2 items
	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	7 items

SAMPLE SUMMARY

Sample counts by matrix	35 Soils, 2 Waters &	Type of documentation received	COC
Date documentation received	12/12/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4.7°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE134396 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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP9 1.1-1.2	SE134396.006	LB069537	10 Dec 2014	12 Dec 2014	07 Jan 2015	18 Dec 2014	07 Jan 2015	23 Dec 2014
TP9 3.9-4.0	SE134396.008	LB069537	10 Dec 2014	12 Dec 2014	07 Jan 2015	18 Dec 2014	07 Jan 2015	22 Dec 2014
TP11 0.4-0.5	SE134396.013	LB069537	11 Dec 2014	12 Dec 2014	08 Jan 2015	18 Dec 2014	08 Jan 2015	22 Dec 2014
TP13 1.9-2.0	SE134396.017	LB069537	11 Dec 2014	12 Dec 2014	08 Jan 2015	18 Dec 2014	08 Jan 2015	23 Dec 2014
TP13 3.5-3.6	SE134396.018	LB069537	11 Dec 2014	12 Dec 2014	08 Jan 2015	18 Dec 2014	08 Jan 2015	22 Dec 2014
TP15 0.9-1.0	SE134396.024	LB069537	10 Dec 2014	12 Dec 2014	07 Jan 2015	18 Dec 2014	07 Jan 2015	22 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069537	11 Dec 2014	12 Dec 2014	08 Jan 2015	18 Dec 2014	08 Jan 2015	22 Dec 2014
TP17 2.9-3.0	SE134396.029	LB069537	11 Dec 2014	12 Dec 2014	08 Jan 2015	18 Dec 2014	08 Jan 2015	22 Dec 2014

Gravimetric Determination of Asbestos in Soil

Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP8 0.9-1.0	SE134396.002	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP8 1.9-2.0	SE134396.003	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP8 2.8-2.9	SE134396.004	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 1.1-1.2	SE134396.006	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 3.9-4.0	SE134396.008	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP10 1.9-2.0	SE134396.010	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP10 3.9-4.0	SE134396.011	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP11 0.4-0.5	SE134396.013	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP12 0.4-0.5	SE134396.015	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP13 1.9-2.0	SE134396.017	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP13 3.5-3.6	SE134396.018	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP14 5.4-5.5	SE134396.022	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP15 0.9-1.0	SE134396.024	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP16 0.6-0.7	SE134396.026	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP17 0.9-1.0	SE134396.028	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP17 2.9-3.0	SE134396.029	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP18 0.6-0.7	SE134396.031	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
TP19 0.6-0.7	SE134396.033	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014
QC7	SE134396.034	LB069663	10 Dec 2014	12 Dec 2014	08 Jun 2015	19 Dec 2014	08 Jun 2015	23 Dec 2014
QC9	SE134396.035	LB069663	11 Dec 2014	12 Dec 2014	09 Jun 2015	19 Dec 2014	09 Jun 2015	23 Dec 2014

Mercury in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP8 0.9-1.0	SE134396.002	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP8 2.8-2.9	SE134396.004	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP9 1.1-1.2	SE134396.006	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP9 3.9-4.0	SE134396.008	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069367	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	22 Dec 2014
TP10 1.9-2.0	SE134396.010	LB069367	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	22 Dec 2014
TP10 3.9-4.0	SE134396.011	LB069367	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	22 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069367	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	22 Dec 2014
TP11 0.4-0.5	SE134396.013	LB069367	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	22 Dec 2014

HOLDING TIME SUMMARY

SE134396 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 in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP12 0.0-0.1	SE134396.014	LB069367	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	22 Dec 2014
TP12 0.4-0.5	SE134396.015	LB069368	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	19 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP13 1.9-2.0	SE134396.017	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP13 3.5-3.6	SE134396.018	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP14 5.4-5.5	SE134396.022	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069368	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	19 Dec 2014
TP15 0.9-1.0	SE134396.024	LB069368	10 Dec 2014	12 Dec 2014	07 Jan 2015	16 Dec 2014	07 Jan 2015	19 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP16 0.6-0.7	SE134396.026	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP17 0.9-1.0	SE134396.028	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP17 2.9-3.0	SE134396.029	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP18 0.6-0.7	SE134396.031	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
TP19 0.6-0.7	SE134396.033	LB069368	11 Dec 2014	12 Dec 2014	08 Jan 2015	16 Dec 2014	08 Jan 2015	19 Dec 2014
QC7	SE134396.034	LB069506	10 Dec 2014	12 Dec 2014	07 Jan 2015	17 Dec 2014	07 Jan 2015	22 Dec 2014
QC9	SE134396.035	LB069506	11 Dec 2014	12 Dec 2014	08 Jan 2015	17 Dec 2014	08 Jan 2015	22 Dec 2014

Moisture Content

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP8 0.9-1.0	SE134396.002	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP8 2.8-2.9	SE134396.004	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP9 1.1-1.2	SE134396.006	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP9 3.9-4.0	SE134396.008	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP10 1.9-2.0	SE134396.010	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP10 3.9-4.0	SE134396.011	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP11 0.4-0.5	SE134396.013	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP12 0.4-0.5	SE134396.015	LB069509	10 Dec 2014	12 Dec 2014	24 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP13 1.9-2.0	SE134396.017	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP13 3.5-3.6	SE134396.018	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069509	11 Dec 2014	12 Dec 2014	25 Dec 2014	17 Dec 2014	22 Dec 2014	18 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP14 5.4-5.5	SE134396.022	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069592	10 Dec 2014	12 Dec 2014	24 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP15 0.9-1.0	SE134396.024	LB069592	10 Dec 2014	12 Dec 2014	24 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP16 0.6-0.7	SE134396.026	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP17 0.9-1.0	SE134396.028	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP17 2.9-3.0	SE134396.029	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP18 0.6-0.7	SE134396.031	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
TP19 0.6-0.7	SE134396.033	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
QC7	SE134396.034	LB069592	10 Dec 2014	12 Dec 2014	24 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014
QC9	SE134396.035	LB069592	11 Dec 2014	12 Dec 2014	25 Dec 2014	18 Dec 2014	23 Dec 2014	19 Dec 2014

HOLDING TIME SUMMARY

SE134396 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.

OC Pesticides in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC7	SE134396.034	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC9	SE134396.035	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

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
TP8 0.0-0.1	SE134396.001	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
QC7	SE134396.034	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
QC9	SE134396.035	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014

PCBs in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC7	SE134396.034	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC9	SE134396.035	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE134396 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.

pH in soil (1:5) (continued)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP9 1.1-1.2	SE134396.006	LB069427	10 Dec 2014	12 Dec 2014	17 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP9 3.9-4.0	SE134396.008	LB069427	10 Dec 2014	12 Dec 2014	17 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP11 0.4-0.5	SE134396.013	LB069427	11 Dec 2014	12 Dec 2014	18 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP13 1.9-2.0	SE134396.017	LB069427	11 Dec 2014	12 Dec 2014	18 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP13 3.5-3.6	SE134396.018	LB069427	11 Dec 2014	12 Dec 2014	18 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP15 0.9-1.0	SE134396.024	LB069428	10 Dec 2014	12 Dec 2014	17 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP17 0.0-0.1	SE134396.027	LB069428	11 Dec 2014	12 Dec 2014	18 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†
TP17 2.9-3.0	SE134396.029	LB069428	11 Dec 2014	12 Dec 2014	18 Dec 2014	16 Dec 2014	17 Dec 2014	18 Dec 2014†

Speciated Phenols in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
QC7	SE134396.034	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
QC9	SE134396.035	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP9 1.1-1.2	SE134396.006	LB069792	10 Dec 2014	12 Dec 2014	07 Jan 2015	23 Dec 2014	07 Jan 2015	23 Dec 2014
TP9 3.9-4.0	SE134396.008	LB069792	10 Dec 2014	12 Dec 2014	07 Jan 2015	23 Dec 2014	07 Jan 2015	23 Dec 2014
TP11 0.4-0.5	SE134396.013	LB069792	11 Dec 2014	12 Dec 2014	08 Jan 2015	23 Dec 2014	08 Jan 2015	23 Dec 2014
TP13 1.9-2.0	SE134396.017	LB069792	11 Dec 2014	12 Dec 2014	08 Jan 2015	23 Dec 2014	08 Jan 2015	23 Dec 2014
TP13 3.5-3.6	SE134396.018	LB069792	11 Dec 2014	12 Dec 2014	08 Jan 2015	23 Dec 2014	08 Jan 2015	23 Dec 2014
TP15 0.9-1.0	SE134396.024	LB069792	10 Dec 2014	12 Dec 2014	07 Jan 2015	23 Dec 2014	07 Jan 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069792	11 Dec 2014	12 Dec 2014	08 Jan 2015	23 Dec 2014	08 Jan 2015	23 Dec 2014
TP17 2.9-3.0	SE134396.029	LB069792	11 Dec 2014	12 Dec 2014	08 Jan 2015	23 Dec 2014	08 Jan 2015	23 Dec 2014

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
TP8 0.0-0.1	SE134396.001	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP8 0.9-1.0	SE134396.002	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP8 2.8-2.9	SE134396.004	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 1.1-1.2	SE134396.006	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP9 3.9-4.0	SE134396.008	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP10 1.9-2.0	SE134396.010	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP10 3.9-4.0	SE134396.011	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP11 0.4-0.5	SE134396.013	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP12 0.4-0.5	SE134396.015	LB069703	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP13 1.9-2.0	SE134396.017	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP13 3.5-3.6	SE134396.018	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069703	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014

HOLDING TIME SUMMARY

SE134396 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.

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP14 2.9-3.0	SE134396.021	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP14 5.4-5.5	SE134396.022	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069705	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP15 0.9-1.0	SE134396.024	LB069705	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP16 0.6-0.7	SE134396.026	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP17 0.9-1.0	SE134396.028	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP17 2.9-3.0	SE134396.029	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP18 0.6-0.7	SE134396.031	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
TP19 0.6-0.7	SE134396.033	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014
QC7	SE134396.034	LB069705	10 Dec 2014	12 Dec 2014	08 Jun 2015	22 Dec 2014	08 Jun 2015	23 Dec 2014
QC9	SE134396.035	LB069705	11 Dec 2014	12 Dec 2014	09 Jun 2015	22 Dec 2014	09 Jun 2015	23 Dec 2014

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
TP8 0.0-0.1	SE134396.001	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP9 2.9-3.0	SE134396.007	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP 14 0.9-1.0	SE134396.020	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 2.9-3.0	SE134396.021	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	22 Dec 2014
QC7	SE134396.034	LB069311	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
QC9	SE134396.035	LB069311	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014

VOC's in Soil

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP8 0.0-0.1	SE134396.001	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP12 0.0-0.1	SE134396.014	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014

VOCs in Water

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TB4	SE134396.036	LB069518	11 Dec 2014	12 Dec 2014	18 Dec 2014	17 Dec 2014	26 Jan 2015	18 Dec 2014
TS4	SE134396.037	LB069518	11 Dec 2014	12 Dec 2014	18 Dec 2014	17 Dec 2014	26 Jan 2015	18 Dec 2014

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
TP8 0.0-0.1	SE134396.001	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP9 0.0-0.1	SE134396.005	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP10 0.4-0.5	SE134396.009	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP11 0.0-0.1	SE134396.012	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014

HOLDING TIME SUMMARY

SE134396 R0

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

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

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

Volatile Petroleum Hydrocarbons in Soil (continued)

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
TP12 0.0-0.1	SE134396.014	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP13 0.0-0.1	SE134396.016	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP14 0.0-0.1	SE134396.019	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP15 0.0-0.1	SE134396.023	LB069296	10 Dec 2014	12 Dec 2014	24 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP16 0.0-0.1	SE134396.025	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP17 0.0-0.1	SE134396.027	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP18 0.0-0.1	SE134396.030	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014
TP19 0.0-0.1	SE134396.032	LB069296	11 Dec 2014	12 Dec 2014	25 Dec 2014	15 Dec 2014	24 Jan 2015	23 Dec 2014

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
TB4	SE134396.036	LB069518	11 Dec 2014	12 Dec 2014	18 Dec 2014	17 Dec 2014	26 Jan 2015	18 Dec 2014
TS4	SE134396.037	LB069518	11 Dec 2014	12 Dec 2014	18 Dec 2014	17 Dec 2014	26 Jan 2015	18 Dec 2014

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)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	93
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	90
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	87
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	99
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	97
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	98
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	95
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	95
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	97
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	103
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	97
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	87

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	TP8 0.0-0.1	SE134396.001	%	70 - 130%	84
	TP9 0.0-0.1	SE134396.005	%	70 - 130%	80
	TP9 2.9-3.0	SE134396.007	%	70 - 130%	82
	TP10 0.4-0.5	SE134396.009	%	70 - 130%	84
	TP11 0.0-0.1	SE134396.012	%	70 - 130%	92
	TP12 0.0-0.1	SE134396.014	%	70 - 130%	82
	TP13 0.0-0.1	SE134396.016	%	70 - 130%	90
	TP14 0.0-0.1	SE134396.019	%	70 - 130%	78
	TP 14 0.9-1.0	SE134396.020	%	70 - 130%	76
	TP14 2.9-3.0	SE134396.021	%	70 - 130%	84
	TP15 0.0-0.1	SE134396.023	%	70 - 130%	88
	TP16 0.0-0.1	SE134396.025	%	70 - 130%	82
	TP17 0.0-0.1	SE134396.027	%	70 - 130%	90
	TP18 0.0-0.1	SE134396.030	%	70 - 130%	84
	TP19 0.0-0.1	SE134396.032	%	70 - 130%	84
	QC7	SE134396.034	%	70 - 130%	80
	QC9	SE134396.035	%	70 - 130%	88
d14-p-terphenyl (Surrogate)	TP8 0.0-0.1	SE134396.001	%	70 - 130%	96
	TP9 0.0-0.1	SE134396.005	%	70 - 130%	102
	TP9 2.9-3.0	SE134396.007	%	70 - 130%	94
	TP10 0.4-0.5	SE134396.009	%	70 - 130%	92
	TP11 0.0-0.1	SE134396.012	%	70 - 130%	92
	TP12 0.0-0.1	SE134396.014	%	70 - 130%	110
	TP13 0.0-0.1	SE134396.016	%	70 - 130%	96
	TP14 0.0-0.1	SE134396.019	%	70 - 130%	104
	TP 14 0.9-1.0	SE134396.020	%	70 - 130%	104
	TP14 2.9-3.0	SE134396.021	%	70 - 130%	86
	TP15 0.0-0.1	SE134396.023	%	70 - 130%	102
	TP16 0.0-0.1	SE134396.025	%	70 - 130%	100
	TP17 0.0-0.1	SE134396.027	%	70 - 130%	94
	TP18 0.0-0.1	SE134396.030	%	70 - 130%	108
	TP19 0.0-0.1	SE134396.032	%	70 - 130%	96
	QC7	SE134396.034	%	70 - 130%	114
	QC9	SE134396.035	%	70 - 130%	84
d5-nitrobenzene (Surrogate)	TP8 0.0-0.1	SE134396.001	%	70 - 130%	92
	TP9 0.0-0.1	SE134396.005	%	70 - 130%	94
	TP9 2.9-3.0	SE134396.007	%	70 - 130%	96
	TP10 0.4-0.5	SE134396.009	%	70 - 130%	96
	TP11 0.0-0.1	SE134396.012	%	70 - 130%	104
	TP12 0.0-0.1	SE134396.014	%	70 - 130%	104
	TP13 0.0-0.1	SE134396.016	%	70 - 130%	102
	TP14 0.0-0.1	SE134396.019	%	70 - 130%	104
	TP 14 0.9-1.0	SE134396.020	%	70 - 130%	100
	TP14 2.9-3.0	SE134396.021	%	70 - 130%	96
	TP15 0.0-0.1	SE134396.023	%	70 - 130%	104
	TP16 0.0-0.1	SE134396.025	%	70 - 130%	104

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)	TP17 0.0-0.1	SE134396.027	%	70 - 130%	106
	TP18 0.0-0.1	SE134396.030	%	70 - 130%	108
	TP19 0.0-0.1	SE134396.032	%	70 - 130%	104
	QC7	SE134396.034	%	70 - 130%	104
	QC9	SE134396.035	%	70 - 130%	98

PCBs in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	93
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	90
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	87
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	99
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	97
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	98
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	95
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	95
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	97
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	103
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	97
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	87

Speciated Phenols in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	TP8 0.0-0.1	SE134396.001	%	70 - 130%	82
	TP9 0.0-0.1	SE134396.005	%	70 - 130%	83
	TP10 0.4-0.5	SE134396.009	%	70 - 130%	75
	TP11 0.0-0.1	SE134396.012	%	70 - 130%	91
	TP12 0.0-0.1	SE134396.014	%	70 - 130%	74
	TP13 0.0-0.1	SE134396.016	%	70 - 130%	90
	TP14 0.0-0.1	SE134396.019	%	70 - 130%	88
	TP15 0.0-0.1	SE134396.023	%	70 - 130%	91
	TP16 0.0-0.1	SE134396.025	%	70 - 130%	90
	TP17 0.0-0.1	SE134396.027	%	70 - 130%	92
	TP18 0.0-0.1	SE134396.030	%	70 - 130%	84
	TP19 0.0-0.1	SE134396.032	%	70 - 130%	88
d5-phenol (Surrogate)	TP8 0.0-0.1	SE134396.001	%	50 - 130%	70
	TP9 0.0-0.1	SE134396.005	%	50 - 130%	71
	TP10 0.4-0.5	SE134396.009	%	50 - 130%	70
	TP11 0.0-0.1	SE134396.012	%	50 - 130%	74
	TP12 0.0-0.1	SE134396.014	%	50 - 130%	71
	TP13 0.0-0.1	SE134396.016	%	50 - 130%	71
	TP14 0.0-0.1	SE134396.019	%	50 - 130%	74
	TP15 0.0-0.1	SE134396.023	%	50 - 130%	72
	TP16 0.0-0.1	SE134396.025	%	50 - 130%	71
	TP17 0.0-0.1	SE134396.027	%	50 - 130%	74
	TP18 0.0-0.1	SE134396.030	%	50 - 130%	70
	TP19 0.0-0.1	SE134396.032	%	50 - 130%	70

VOC's in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	84
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	76
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	78
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	79
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	87
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	77
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	79
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	74
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	74
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	79
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	84
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	79

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 %
d4-1,2-dichloroethane (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	85
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	74
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	83
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	74
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	85
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	71
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	80
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	74
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	78
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	79
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	81
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	74
d8-toluene (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	84
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	73
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	83
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	72
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	81
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	72
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	81
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	72
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	77
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	78
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	79
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	71
Dibromofluoromethane (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	82
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	73
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	81
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	71
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	86
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	71
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	78
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	72
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	75
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	77
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	80
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	71

VOCs in Water

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TB4	SE134396.036	%	40 - 130%	82
	TS4	SE134396.037	%	40 - 130%	103
d4-1,2-dichloroethane (Surrogate)	TB4	SE134396.036	%	40 - 130%	127
	TS4	SE134396.037	%	40 - 130%	118
d8-toluene (Surrogate)	TB4	SE134396.036	%	40 - 130%	89
	TS4	SE134396.037	%	40 - 130%	85
Dibromofluoromethane (Surrogate)	TB4	SE134396.036	%	40 - 130%	127
	TS4	SE134396.037	%	40 - 130%	115

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	84
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	76
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	78
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	79
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	87
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	77
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	79
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	74
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	74
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	79
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	84
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	79

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

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

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d4-1,2-dichloroethane (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	85
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	74
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	83
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	74
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	85
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	71
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	80
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	74
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	78
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	79
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	81
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	74
d8-toluene (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	84
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	73
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	83
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	72
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	81
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	72
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	81
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	72
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	77
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	78
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	79
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	71
Dibromofluoromethane (Surrogate)	TP8 0.0-0.1	SE134396.001	%	60 - 130%	82
	TP9 0.0-0.1	SE134396.005	%	60 - 130%	73
	TP10 0.4-0.5	SE134396.009	%	60 - 130%	81
	TP11 0.0-0.1	SE134396.012	%	60 - 130%	71
	TP12 0.0-0.1	SE134396.014	%	60 - 130%	86
	TP13 0.0-0.1	SE134396.016	%	60 - 130%	71
	TP14 0.0-0.1	SE134396.019	%	60 - 130%	78
	TP15 0.0-0.1	SE134396.023	%	60 - 130%	72
	TP16 0.0-0.1	SE134396.025	%	60 - 130%	75
	TP17 0.0-0.1	SE134396.027	%	60 - 130%	77
	TP18 0.0-0.1	SE134396.030	%	60 - 130%	80
	TP19 0.0-0.1	SE134396.032	%	60 - 130%	71

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TB4	SE134396.036	%	40 - 130%	82
d4-1,2-dichloroethane (Surrogate)	TB4	SE134396.036	%	60 - 130%	127
d8-toluene (Surrogate)	TB4	SE134396.036	%	40 - 130%	89
Dibromofluoromethane (Surrogate)	TB4	SE134396.036	%	40 - 130%	127

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.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

Mercury in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB069367.001	Mercury	mg/kg	0.01	<0.01
LB069368.001	Mercury	mg/kg	0.01	<0.01
LB069506.001	Mercury	mg/kg	0.01	<0.01

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069311.001		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)	%	-	79

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069311.001		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)	%	-	84
		2-fluorobiphenyl (Surrogate)	%	-	70
		d14-p-terphenyl (Surrogate)	%	-	96

PCBs in Soil

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

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.

PCBs in Soil (continued)

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

Sample Number		Parameter	Units	LOR	Result
LB069311.001		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)	%	-	79

Speciated Phenols in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069311.001		Phenol	mg/kg	0.5	<0.5
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
		2-chlorophenol	mg/kg	0.5	<0.5
		2,4-dimethylphenol	mg/kg	0.5	<0.5
		2,6-dichlorophenol	mg/kg	0.5	<0.5
		2,4-dichlorophenol	mg/kg	0.5	<0.5
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5
		2-nitrophenol	mg/kg	0.5	<0.5
		4-nitrophenol	mg/kg	1	<1
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
		Pentachlorophenol	mg/kg	0.5	<0.5
		2,4-dinitrophenol	mg/kg	2	<2
		4-chloro-3-methylphenol	mg/kg	2	<2
	Surrogates	2,4,6-Tribromophenol (Surrogate)	%	-	81
		d5-phenol (Surrogate)	%	-	71

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

Sample Number	Parameter	Units	LOR	Result
LB069703.001	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
	Iron, Fe	mg/kg	50	<50
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB069705.001	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
	Iron, Fe	mg/kg	50	<50
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB069311.001	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

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
LB069296.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	82
		d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	96
		Bromofluorobenzene (Surrogate)	%	-	82
	Totals	Total BTEX*	mg/kg	0.6	<0.6

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result
LB069518.001	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)	%	-	123
		d4-1,2-dichloroethane (Surrogate)	%	-	128
		d8-toluene (Surrogate)	%	-	90
		Bromofluorobenzene (Surrogate)	%	-	85

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB069296.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	82
		d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	96

Volatile Petroleum Hydrocarbons in Water

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

Sample Number		Parameter	Units	LOR	Result
LB069518.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	123
		d4-1,2-dichloroethane (Surrogate)	%	-	128
		d8-toluene (Surrogate)	%	-	90
		Bromofluorobenzene (Surrogate)	%	-	85

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 %
SE134396.005	LB069367.014	Mercury	mg/kg	0.01	0.01	0.01	200	0
SE134396.014	LB069367.024	Mercury	mg/kg	0.01	<0.01	<0.01	200	0
SE134396.024	LB069368.014	Mercury	mg/kg	0.01	<0.01	<0.01	200	0
SE134396.033	LB069368.024	Mercury	mg/kg	0.01	0.05	0.04	149	0
SE134483.009	LB069506.014	Mercury	mg/kg	0.01	<0.01	<0.01	200	0
SE134532.001	LB069506.020	Mercury	mg/kg	0.01	0.08	0.10	86	20

Moisture Content

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.011	LB069509.011	% Moisture	%w/w	0.5	8.7	8.5	42	3
SE134396.020	LB069509.021	% Moisture	%	0.5	11	11	39	5
SE134396.030	LB069592.011	% Moisture	%w/w	0.5	16	16	36	4
SE134396.035	LB069592.017	% Moisture	%	0.5	7.5	7.9	43	5

OC Pesticides in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.032	LB069311.021		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	-	0.13	0.14	30	4

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.023	LB069311.017	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0

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 %
SE134396.023	LB069311.017		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	13
SE134396.032	LB069311.022		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	0
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	4

PCBs in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.032	LB069311.021		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	30	4

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.018	LB069427.010	pH	pH Units	-	4.8	4.7	32	3
SE134410.011	LB069428.012	pH	pH Units	-	7.8	7.9	31	1

Speciated Phenols in Soil

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.030	LB069311.020	Phenol	mg/kg	0.5	<0.5	<0.5	200	0
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	200	0
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	200	0
		Total Cresol	mg/kg	1.5	<1.5	<1.5	200	0

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

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

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

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

Speciated Phenols in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.030	LB069311.020		2-chlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2-nitrophenol	mg/kg	0.5	<0.5	<0.5	200	0
			4-nitrophenol	mg/kg	1	<1	<1	200	0
			2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	200	0
			Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	200	0
			2,4-dinitrophenol	mg/kg	2	<2	<2	200	0
			4-chloro-3-methylphenol	mg/kg	2	<2	<2	200	0
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.2	4.3	30	4
			d5-phenol (Surrogate)	mg/kg	-	1.4	1.4	30	0

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.006	LB069792.004	Total Organic Carbon	%w/w	0.05	1.4	1.6	18	14
SE134396.008	LB069792.006	Total Organic Carbon	%w/w	0.05	0.32	0.36	30	11

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 %
SE134396.011	LB069703.014	Arsenic, As	mg/kg	3	11	11	39	1
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	190	0
		Chromium, Cr	mg/kg	0.3	14	14	34	2
		Copper, Cu	mg/kg	0.5	38	34	31	10
		Lead, Pb	mg/kg	1	22	18	35	20
		Nickel, Ni	mg/kg	0.5	25	25	32	0
		Zinc, Zn	mg/kg	0.5	91	95	32	4
SE134396.020	LB069703.024	Arsenic, As	mg/kg	3	6	6	47	5
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	183	0
		Chromium, Cr	mg/kg	0.3	24	24	32	2
		Copper, Cu	mg/kg	0.5	12	13	34	3
		Lead, Pb	mg/kg	1	31	28	33	9
		Nickel, Ni	mg/kg	0.5	8.9	10	35	13
		Zinc, Zn	mg/kg	0.5	38	49	35	25
SE134396.030	LB069705.014	Arsenic, As	mg/kg	3	4	3	57	17
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	24	26	32	6
		Copper, Cu	mg/kg	0.5	8.6	7.8	36	10
		Lead, Pb	mg/kg	1	33	23	34	35 ②
		Nickel, Ni	mg/kg	0.5	7.8	7.3	37	6
		Zinc, Zn	mg/kg	0.5	73	77	33	5
SE134582.001	LB069705.023	Arsenic, As	mg/kg	3	4	5	53	5
		Cadmium, Cd	mg/kg	0.3	0.2	0.1	200	0
		Chromium, Cr	mg/kg	0.3	5.3	3.9	41	32
		Copper, Cu	mg/kg	0.5	9.5	8.7	35	9
		Lead, Pb	mg/kg	1	15	12	38	22
		Nickel, Ni	mg/kg	0.5	1.9	2.0	56	1
		Zinc, Zn	mg/kg	0.5	71	65	33	8

TRH (Total Recoverable Hydrocarbons) in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.023	LB069311.016		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	<25	<25	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.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.023	LB069311.016	TRH F Bands	TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE134396.032	LB069311.021		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) minus Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396.009	LB069296.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	4.3	50	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.1	4.4	50	5
			d8-toluene (Surrogate)	mg/kg	-	4.2	4.3	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.2	50	6
		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
SE134396.032	LB069296.024	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.8	50	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	3.9	50	4
			d8-toluene (Surrogate)	mg/kg	-	3.6	3.8	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	3.8	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 %
SE134396.009	LB069296.014		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	4.3	30	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.1	4.4	30	5
			d8-toluene (Surrogate)	mg/kg	-	4.2	4.3	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	4.2	30	6
		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
SE134396.032	LB069296.024		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.8	30	6
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	3.9	30	4
			d8-toluene (Surrogate)	mg/kg	-	3.6	3.8	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	3.8	30	2
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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

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

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069537.025		Exchangeable Sodium, Na	mg/kg	2	NA	160	80 - 120	114
		Exchangeable Potassium, K	mg/kg	2	NA	330	80 - 120	102
		Exchangeable Calcium, Ca	mg/kg	2	NA	4347	80 - 120	86
		Exchangeable Magnesium, Mg	mg/kg	2	NA	1578	80 - 120	86

Mercury in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069367.002		Mercury	mg/kg	0.01	0.19	0.2	70 - 130	97
LB069368.002		Mercury	mg/kg	0.01	0.19	0.2	70 - 130	97
LB069506.002		Mercury	mg/kg	0.01	0.21	0.2	70 - 130	104

OC Pesticides in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069311.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	97
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	93
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	95
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	90
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	100
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	92
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.15	40 - 130	85

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069311.002		Naphthalene	mg/kg	0.1	4.0	4	60 - 140	99
		Acenaphthylene	mg/kg	0.1	4.0	4	60 - 140	100
		Acenaphthene	mg/kg	0.1	3.9	4	60 - 140	97
		Phenanthrene	mg/kg	0.1	4.1	4	60 - 140	102
		Anthracene	mg/kg	0.1	3.6	4	60 - 140	89
		Fluoranthene	mg/kg	0.1	3.8	4	60 - 140	95
		Pyrene	mg/kg	0.1	3.8	4	60 - 140	95
		Benzo(a)pyrene	mg/kg	0.1	4.3	4	60 - 140	107
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	94

PCBs in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069311.002		Arochlor 1260	mg/kg	0.2	0.3	0.4	60 - 140	87

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069427.001		pH	pH Units	-	7.4	7.415	98 - 102	99
LB069428.001		pH	pH Units	-	7.3	7.415	98 - 102	99

Speciated Phenols in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069311.002		Phenol	mg/kg	0.5	0.9	1	70 - 130	88
		2,4-dichlorophenol	mg/kg	0.5	1.1	1	70 - 130	105
		2,4,6-trichlorophenol	mg/kg	0.5	1.1	1	70 - 130	106
		Pentachlorophenol	mg/kg	0.5	1.0	1	70 - 130	104
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.0	5	40 - 130	79
		d5-phenol (Surrogate)	mg/kg	-	1.5	2	40 - 130	75

TOC in Soil

Method: ME-(AU)-[ENV]AN188

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069792.002		Total Organic Carbon	%w/w	0.05	0.30	0.325	80 - 120	93

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

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

Sample Number		Parameter	Units	LOR

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

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

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest (continued)

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069703.002		Arsenic, As	mg/kg	3	44	50	80 - 120	88
		Cadmium, Cd	mg/kg	0.3	46	50	80 - 120	93
		Chromium, Cr	mg/kg	0.3	44	50	80 - 120	89
		Copper, Cu	mg/kg	0.5	42	50	80 - 120	84
		Lead, Pb	mg/kg	1	45	50	80 - 120	90
		Iron, Fe	mg/kg	50	<50	50	80 - 120	89
		Nickel, Ni	mg/kg	0.5	45	50	80 - 120	89
		Zinc, Zn	mg/kg	0.5	45	50	80 - 120	90
LB069705.002		Arsenic, As	mg/kg	3	47	50	80 - 120	94
		Cadmium, Cd	mg/kg	0.3	48	50	80 - 120	97
		Chromium, Cr	mg/kg	0.3	46	50	80 - 120	93
		Copper, Cu	mg/kg	0.5	44	50	80 - 120	87
		Lead, Pb	mg/kg	1	47	50	80 - 120	93
		Iron, Fe	mg/kg	50	<50	50	80 - 120	94
		Nickel, Ni	mg/kg	0.5	46	50	80 - 120	93
		Zinc, Zn	mg/kg	0.5	47	50	80 - 120	93

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069311.002		TRH C10-C14	mg/kg	20	36	40	60 - 140	90
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	93
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	36	40	60 - 140	90
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	88
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069296.002	Monocyclic	Benzene	mg/kg	0.1	2.3	2.9	60 - 140	80
	Aromatic	Toluene	mg/kg	0.1	2.3	2.9	60 - 140	78
		Ethylbenzene	mg/kg	0.1	2.5	2.9	60 - 140	86
		m/p-xylene	mg/kg	0.2	5.3	5.8	60 - 140	92
		o-xylene	mg/kg	0.1	2.5	2.9	60 - 140	88
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	85
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	5	60 - 140	95
		d8-toluene (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.8	5	60 - 140	116

VOCs in Water

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069518.002	Monocyclic	Benzene	µg/L	0.5	53	45.45	60 - 140	117
	Aromatic	Toluene	µg/L	0.5	48	45.45	60 - 140	106
		Ethylbenzene	µg/L	0.5	55	45.45	60 - 140	121
		m/p-xylene	µg/L	1	120	90.9	60 - 140	127
		o-xylene	µg/L	0.5	58	45.45	60 - 140	128
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.7	5	60 - 140	114
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.7	5	60 - 140	115
		d8-toluene (Surrogate)	µg/L	-	4.4	5	60 - 140	87
		Bromofluorobenzene (Surrogate)	µg/L	-	5.2	5	60 - 140	104

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069296.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	86
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	75
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	5	60 - 140	85
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.8	5	60 - 140	95
		d8-toluene (Surrogate)	mg/kg	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.8	5	60 - 140	116
	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

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.

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB069518.002		TRH C6-C10	µg/L	50	940	946.63	60 - 140	100
		TRH C6-C9	µg/L	40	830	818.71	60 - 140	101
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.7	5	60 - 140	114
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.7	5	60 - 140	115
		d8-toluene (Surrogate)	µg/L	-	4.4	5	60 - 140	87
		Bromofluorobenzene (Surrogate)	µg/L	-	5.2	5	60 - 140	104
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	610	639.67	60 - 140	96

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

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

Mercury in Soil

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.023	LB069367.004	Mercury	mg/kg	0.01	0.20	0.01	0.2	95
SE134396.015	LB069368.004	Mercury	mg/kg	0.01	0.17	<0.01	0.2	83
SE134396.034	LB069506.004	Mercury	mg/kg	0.01	0.19	<0.01	0.2	97

OC Pesticides in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134396.012	LB069311.009		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	111
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	104
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	109
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	98
			Endrin	mg/kg	0.2	0.2	<0.2	0.2	109
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	102
			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	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	-	97

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134396.005	LB069311.006		Naphthalene	mg/kg	0.1	3.9	<0.1	4	98
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	3.8	<0.1	4	96
			Acenaphthene	mg/kg	0.1	3.8	<0.1	4	96
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	4.1	<0.1	4	103
			Anthracene	mg/kg	0.1	3.8	<0.1	4	94
			Fluoranthene	mg/kg	0.1	4.2	<0.1	4	104
			Pyrene	mg/kg	0.1	3.7	<0.1	4	92
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.2	<0.1	4	104
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ	0.2	4.2	<0.2	-	-
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	4.3	<0.3	-	-
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	4.2	<0.2	-	-
			Total PAH	mg/kg	0.8	31	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	-	98
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	82

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

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

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134396.005	LB069311.006	Surrogates	d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	-	96

PCBs in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134396.016	LB069311.011		Arochlor 1016	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	0.4	<0.2	0.4	105
			Arochlor 1262	mg/kg	0.2	<0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0	-	104

Speciated Phenols in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134396.016	LB069311.011		Phenol	mg/kg	0.5	1.0	<0.5	1	99
			2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	-	-
			3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	-	-
			Total Cresol	mg/kg	1.5	<1.5	<1.5	-	-
			2-chlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,4-dichlorophenol	mg/kg	0.5	1.1	<0.5	1	111
			2,4,6-trichlorophenol	mg/kg	0.5	1.0	<0.5	1	103
			2-nitrophenol	mg/kg	0.5	<0.5	<0.5	-	-
			4-nitrophenol	mg/kg	1	<1	<1	-	-
			2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	-
			2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	-	-
			Pentachlorophenol	mg/kg	0.5	1.3	<0.5	1	126
			2,4-dinitrophenol	mg/kg	2	<2	<2	-	-
			4-chloro-3-methylphenol	mg/kg	2	<2	<2	-	-
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.9	4.5	5	98
			d5-phenol (Surrogate)	mg/kg	-	1.5	1.4	2	77

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%
SE134396.001	LB069703.004		Arsenic, As	mg/kg	3	42	6	50	72
			Cadmium, Cd	mg/kg	0.3	38	0.3	50	75
			Chromium, Cr	mg/kg	0.3	57	18	50	77
			Copper, Cu	mg/kg	0.5	53	18	50	71
			Lead, Pb	mg/kg	1	78	47	50	62 ④
			Nickel, Ni	mg/kg	0.5	49	13	50	72
			Zinc, Zn	mg/kg	0.5	320	290	50	50 ④
SE134396.021	LB069705.004		Arsenic, As	mg/kg	3	42	10	50	63 ④
			Cadmium, Cd	mg/kg	0.3	34	<0.3	50	67 ④
			Chromium, Cr	mg/kg	0.3	45	13	50	64 ④
			Copper, Cu	mg/kg	0.5	48	16	50	63 ④
			Lead, Pb	mg/kg	1	50	20	50	59 ④
			Nickel, Ni	mg/kg	0.5	56	26	50	60 ④
			Zinc, Zn	mg/kg	0.5	83	55	50	56 ④

VOC's in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.002	LB069296.004	Monocyclic	Benzene	mg/kg	0.1	2.2	<0.1	2.9	77
		Aromatic	Toluene	mg/kg	0.1	2.2	<0.1	2.9	77
			Ethylbenzene	mg/kg	0.1	2.3	<0.1	2.9	78
			m/p-xylene	mg/kg	0.2	4.9	<0.2	5.8	84
			o-xylene	mg/kg	0.1	2.2	<0.1	2.9	77
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.8	5	77

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%
SE134376.002	LB069296.004	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	4.2	5	98
			d8-toluene (Surrogate)	mg/kg	-	4.7	4.2	5	94
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	3.6	5	105
		Totals	Total Xylenes*	mg/kg	0.3	7.1	<0.3	-	-
			Total BTEX*	mg/kg	0.6	14	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134376.002	LB069296.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	83
			TRH C6-C9	mg/kg	20	<20	<20	23.2	81
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.8	5	77
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	4.2	5	98
			d8-toluene (Surrogate)	mg/kg	-	4.7	4.2	5	94
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	3.6	5	105
		VPH F	Benzene (F0)	mg/kg	0.1	2.2	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	93

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.

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Any other holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
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Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

SGS Job Ref: SY140911-1-IS

Doc No: EAR-F013 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1	TP8 (0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
.	TP8 (0.4-0.5)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
2	TP8 (0.9-1.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
3	TP8 (1.9-2.0)	10/12/2014		1 plastic bag	soil	ice	Asbestos (WA)	
4	TP8 (2.8-2.9)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA),E coli, Faecal Coliforms and Total Coliforms	
5, ~~8~~ 38	TP9(0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag + ACM fragments	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
.	TP9(0.5-0.6)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
6	TP9(1.1-1.2)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
.	TP9 (1.9-2.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
7	TP9 (2.9-3.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA) and PAH	
8	TP9 (3.9-4.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
.	TP10(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
BS Receipt 12/12/14 9	TP10(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	

Relinquished by: RW	Date: 11/12/14		Time: 3pm	Received by:	Time: 12/12/14 9.00
Relinquished by:	Date:		Time:	Received by:	Time:
Relinquished by:	Date:		Time:	Received by:	Time:

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12 DEC 2014
SE134396

page 1 of 4.

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time: 24hr; 36hr; 48hr; 72hr & 5 to 7 **Days**

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
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33 Maddox Street
Alexandria NSW 2015

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Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
.	TP10(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
10	TP10(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
.	TP10(2.9-3.0)	11/12/2014		1 glass jar	soil	ice		Hold
10	TP10(3.9-4.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
.	TP10(4.9-5.0)	12/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
12	TP11(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
13	TP11(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
14	TP12(0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
15	TP12(0.4-0.5)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
16	TP13(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
.	TP13(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
.	TP13(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
17	TP13(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
.	TP13(2.9-3.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		
18	TP13(3.5-3.6)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
Bth Received 12/12/14 19	TP14(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	

Relinquished by:RW	Date:11/12/14		Time:	Received by: L.A	Time: 12/12/14 4.00
Relinquished by:	Date:		Time:	Received by:	Time:
Relinquished by:	Date:		Time:	Received by:	Time:

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Health Safety &
Environmental Consulting

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Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 1
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Fax: (02) 8594 0499
Email:
ABN 44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
	TP14(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
20	TP14(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA) and PAH	
	TP14(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
21	TP14(2.9-3.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA) and PAH	
	TP14(4.4-4.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
22	TP14(5.4-5.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
23	TP15(0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP15(0.5-0.6)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
24	TP15(0.9-1.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
25	TP16(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
26	TP16(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
27	TP17(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA) and CEC, organic carbon, clay content, iron and pH	
	TP17(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
28	TP17(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
Revised	TP17(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
12/12/14 29	TP17(2.9-3.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	

Relinquished by:RW	Date:11/12/14	Time:	Received by:	Time:	12/12/14 9:00
Relinquished by:	Date:	Time:	Received by:	Time:	
Relinquished by:	Date:	Time:	Received by:	Time:	

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

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Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time: 24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
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ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
30	TP18(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
31	TP18(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
32	TP19(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
33	TP19(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
34	QC6 7	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
	QC6 8	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
35	QC7 9	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
	QC8 10	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
36	TB4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
37	TS4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
RH Revised 12/12/14								

Relinquished by:RW	Date:11/12/14	Time:	Received by:	Time:	12/12/14 9:00
Relinquished by:	Date:	Time:	Received by:	Time:	
Relinquished by:	Date:	Time:	Received by:	Time:	

SGS

SE134396

Job:

	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	1L 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	40 Vial				Storage Location	Bottles Supplied By	Comment	Cooling Method
~~1-38~~ 1-35	S	1		1																									CP
36	W																		2								S190-2 ASB	Ali		Temp
37	W																						1				WO88 SGS	Ali		4.7°
38	M			1																							~~ASB~~ "	"		Good Order
~~35~~	~~GW~~ A																										ASB	Client	—	Y / N
																													Clearly Labelled
																													Y / N
																													Correct Pres.
																													Y / N
																													No Head-space
																													Y / N / NA
																													Sufficient Vol
																													Y / N
																													Doc Date
																													Doc Type
																													Complete Docs
																													Y / N
																													Requested TAT

16 Soils on hold

~~18~~ Soils on hold

SAMPLE RECEIPT ADVICE

SE134396

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609
Telephone	(02) 6239 5656
Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	**SY140911-1-IS**
Samples	38

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 12/12/2014
Report Due	Tue 23/12/2014
SGS Reference	**SE134396**

SUBMISSION DETAILS

This is to confirm that 38 samples were received on Friday 12/12/2014. Results are expected to be ready by Tuesday 23/12/2014. Please quote SGS reference SE134396 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	35 Soils, 2 Waters & 1 Mat	Type of documentation received	COC
Date documentation received	12/12/2014	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4.7°C
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

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

COMMENTS

Trip Spike can only be analysed for BTEX.
Clay Content subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.
E.Coli, Faecal Coliforms and Total Coliforms subcontracted to SONIC FOOD & WATER TESTING, 31-33 Lawson Street Penrith NSW 2750, NATA Accreditation Number: 4034.
16 soil samples have been placed on hold as per client's request. These samples will not be processed.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS , all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx as at the date of this document.
Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE134396

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	Speciated Phenols in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	TP8 0.0-0.1	28	25	11	-	18	10	12	8
005	TP9 0.0-0.1	28	25	11	-	18	10	12	8
006	TP9 1.1-1.2	-	-	-	1	-	-	-	-
007	TP9 2.9-3.0	-	25	-	-	-	-	-	-
008	TP9 3.9-4.0	-	-	-	1	-	-	-	-
009	TP10 0.4-0.5	28	25	11	-	18	10	12	8
012	TP11 0.0-0.1	28	25	11	-	18	10	12	8
013	TP11 0.4-0.5	-	-	-	1	-	-	-	-
014	TP12 0.0-0.1	28	25	11	-	18	10	12	8
016	TP13 0.0-0.1	28	25	11	-	18	10	12	8
017	TP13 1.9-2.0	-	-	-	1	-	-	-	-
018	TP13 3.5-3.6	-	-	-	1	-	-	-	-
019	TP14 0.0-0.1	28	25	11	-	18	10	12	8
020	TP 14 0.9-1.0	-	25	-	-	-	-	-	-
021	TP14 2.9-3.0	-	25	-	-	-	-	-	-
023	TP15 0.0-0.1	28	25	11	-	18	10	12	8
024	TP15 0.9-1.0	-	-	-	1	-	-	-	-

CONTINUED OVERLEAF

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

SE134396

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	Speciated Phenols in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
025	TP16 0.0-0.1	28	25	11	-	18	10	12	8
027	TP17 0.0-0.1	28	25	11	1	18	10	12	8
029	TP17 2.9-3.0	-	-	-	1	-	-	-	-
030	TP18 0.0-0.1	28	25	11	-	18	10	12	8
032	TP19 0.0-0.1	28	25	11	-	18	10	12	8
034	QC7	-	25	-	-	-	-	-	-
035	QC9	-	25	-	-	-	-	-	-

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134396

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Particle sizing of soils <75µm by hydrometer	Particle sizing of soils by sieving	TOC in Soil	Total Recoverable Metals in Soil by ICPOES from
001	TP8 0.0-0.1	-	5	1	-	-	-	7
002	TP8 0.9-1.0	-	5	1	-	-	-	7
003	TP8 1.9-2.0	-	5	-	-	-	-	-
004	TP8 2.8-2.9	-	5	1	-	-	-	7
005	TP9 0.0-0.1	-	5	1	-	-	-	7
006	TP9 1.1-1.2	13	5	1	36	2	1	8
007	TP9 2.9-3.0	-	5	1	-	-	-	7
008	TP9 3.9-4.0	13	5	1	36	2	1	8
009	TP10 0.4-0.5	-	5	1	-	-	-	7
010	TP10 1.9-2.0	-	5	1	-	-	-	7
011	TP10 3.9-4.0	-	5	1	-	-	-	7
012	TP11 0.0-0.1	-	5	1	-	-	-	7
013	TP11 0.4-0.5	13	5	1	36	2	1	8
014	TP12 0.0-0.1	-	5	1	-	-	-	7
015	TP12 0.4-0.5	-	5	1	-	-	-	7
016	TP13 0.0-0.1	-	5	1	-	-	-	7
017	TP13 1.9-2.0	13	5	1	36	2	1	8
018	TP13 3.5-3.6	13	5	1	36	2	1	8
019	TP14 0.0-0.1	-	5	1	-	-	-	7
020	TP 14 0.9-1.0	-	5	1	-	-	-	7
021	TP14 2.9-3.0	-	5	1	-	-	-	7
022	TP14 5.4-5.5	-	5	1	-	-	-	7
023	TP15 0.0-0.1	-	5	1	-	-	-	7
024	TP15 0.9-1.0	13	5	1	36	2	1	8

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134396

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	Fibre ID in bulk materials	Gravimetric Determination of Asbestos in Soil	Mercury in Soil	Particle sizing of soils <75µm by hydrometer	Particle sizing of soils by sieving	TOC in Soil	Total Recoverable Metals in Soil by ICPOES from
025	TP16 0.0-0.1	-	-	5	1	-	-	-	7
026	TP16 0.6-0.7	-	-	5	1	-	-	-	7
027	TP17 0.0-0.1	13	-	5	1	36	2	1	8
028	TP17 0.9-1.0	-	-	5	1	-	-	-	7
029	TP17 2.9-3.0	13	-	5	1	36	2	1	8
030	TP18 0.0-0.1	-	-	5	1	-	-	-	7
031	TP18 0.6-0.7	-	-	5	1	-	-	-	7
032	TP19 0.0-0.1	-	-	5	1	-	-	-	7
033	TP19 0.6-0.7	-	-	5	1	-	-	-	7
034	QC7	-	-	5	1	-	-	-	7
035	QC9	-	-	5	1	-	-	-	7
038	TP9 0.0-0.1	-	1	-	-	-	-	-	-

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134396

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Coliforms in Soil/Sludges	E. coli and Thermotolerant coliforms in Soil	Moisture Content
001	TP8 0.0-0.1	-	-	1
002	TP8 0.9-1.0	-	-	1
004	TP8 2.8-2.9	2	3	1
005	TP9 0.0-0.1	-	-	1
006	TP9 1.1-1.2	-	-	1
007	TP9 2.9-3.0	-	-	1
008	TP9 3.9-4.0	-	-	1
009	TP10 0.4-0.5	-	-	1
010	TP10 1.9-2.0	-	-	1
011	TP10 3.9-4.0	-	-	1
012	TP11 0.0-0.1	-	-	1
013	TP11 0.4-0.5	-	-	1
014	TP12 0.0-0.1	-	-	1
015	TP12 0.4-0.5	-	-	1
016	TP13 0.0-0.1	-	-	1
017	TP13 1.9-2.0	-	-	1
018	TP13 3.5-3.6	-	-	1
019	TP14 0.0-0.1	-	-	1
020	TP 14 0.9-1.0	-	-	1
021	TP14 2.9-3.0	-	-	1
022	TP14 5.4-5.5	-	-	1
023	TP15 0.0-0.1	-	-	1
024	TP15 0.9-1.0	-	-	1

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE134396

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
025	TP16 0.0-0.1	1	-	-
026	TP16 0.6-0.7	1	-	-
027	TP17 0.0-0.1	1	-	-
028	TP17 0.9-1.0	1	-	-
029	TP17 2.9-3.0	1	-	-
030	TP18 0.0-0.1	1	-	-
031	TP18 0.6-0.7	1	-	-
032	TP19 0.0-0.1	1	-	-
033	TP19 0.6-0.7	1	-	-
034	QC7	1	-	-
035	QC9	1	-	-
036	TB4	-	12	8
037	TS4	-	12	-

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ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Ben Kendon	Manager	Huong Crawford
Client	Robson Environmental Pty Ltd	Laboratory	SGS Alexandria Environmental
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	(02) 6239 5656	Telephone	+61 2 8594 0400
Facsimile	(02) 6239 5669	Facsimile	+61 2 8594 0499
Email	ben@robsonlabs.com.au	Email	au.environmental.sydney@sgs.com
Project	**9623 - ESA - Old Canberra Brickworks**	SGS Reference	**SE134396A R0**
Order Number	(Not specified)	Report Number	0000099911
Samples	40	Date Reported	09 Jan 2015
Date Started	07 Jan 2015	Date Received	12 Dec 2014

COMMENTS

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

SIGNATORIES

Ly Kim Ha
Organic Section Head

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.001 Soil 10 Dec 2014 TP8 0.0-0.1	SE134396A.002 Soil 10 Dec 2014 TP8 0.9-1.0	SE134396A.003 Soil 10 Dec 2014 TP8 1.9-2.0	SE134396A.004 Soil 10 Dec 2014 TP8 2.8-2.9
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)	%	-	-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	-	-	-	-
Total PAH	mg/kg	0.8	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.001 Soil 10 Dec 2014 TP8 0.0-0.1	SE134396A.002 Soil 10 Dec 2014 TP8 0.9-1.0	SE134396A.003 Soil 10 Dec 2014 TP8 1.9-2.0	SE134396A.004 Soil 10 Dec 2014 TP8 2.8-2.9
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
Moisture Content Method: AN002							
% Moisture	%	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.005 Soil 10 Dec 2014 TP9 0.0-0.1	SE134396A.006 Soil 10 Dec 2014 TP9 1.1-1.2	SE134396A.007 Soil 10 Dec 2014 TP9 2.9-3.0	SE134396A.008 Soil 10 Dec 2014 TP9 3.9-4.0
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)	%	-	-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	-	-	-	-
Total PAH	mg/kg	0.8	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.005 Soil 10 Dec 2014 TP9 0.0-0.1	SE134396A.006 Soil 10 Dec 2014 TP9 1.1-1.2	SE134396A.007 Soil 10 Dec 2014 TP9 2.9-3.0	SE134396A.008 Soil 10 Dec 2014 TP9 3.9-4.0
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
Moisture Content Method: AN002							
% Moisture	%	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.009 Soil 11 Dec 2014 TP10 0.4-0.5	SE134396A.010 Soil 11 Dec 2014 TP10 1.9-2.0	SE134396A.011 Soil 11 Dec 2014 TP10 3.9-4.0	SE134396A.012 Soil 11 Dec 2014 TP11 0.0-0.1
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)	%	-	-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	-	-	-	-
Total PAH	mg/kg	0.8	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.009 Soil 11 Dec 2014 TP10 0.4-0.5	SE134396A.010 Soil 11 Dec 2014 TP10 1.9-2.0	SE134396A.011 Soil 11 Dec 2014 TP10 3.9-4.0	SE134396A.012 Soil 11 Dec 2014 TP11 0.0-0.1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
Moisture Content Method: AN002							
% Moisture	%	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.013 Soil 11 Dec 2014 TP11 0.4-0.5	SE134396A.014 Soil 10 Dec 2014 TP12 0.0-0.1	SE134396A.015 Soil 10 Dec 2014 TP12 0.4-0.5	SE134396A.016 Soil 11 Dec 2014 TP13 0.0-0.1
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	-	-	-
TRH C6-C9	mg/kg	20	<20	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**73**	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	**84**	-	-	-
d8-toluene (Surrogate)	%	-	**106**	-	-	-
Bromofluorobenzene (Surrogate)	%	-	**90**	-	-	-
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	-	-	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403						
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 C10-C40 Total	mg/kg	210	<210	-	-	-
TRH F Bands						
TRH >C10-C16 (F2)	mg/kg	25	<25	-	-	-
TRH >C16-C34 (F3)	mg/kg	90	<90	-	-	-
TRH >C34-C40 (F4)	mg/kg	120	<120	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420						
Naphthalene	mg/kg	0.1	<0.1	-	-	-
2-methylnaphthalene	mg/kg	0.1	<0.1	-	-	-
1-methylnaphthalene	mg/kg	0.1	<0.1	-	-	-
Acenaphthylene	mg/kg	0.1	<0.1	-	-	-
Acenaphthene	mg/kg	0.1	<0.1	-	-	-
Fluorene	mg/kg	0.1	<0.1	-	-	-
Phenanthrene	mg/kg	0.1	<0.1	-	-	-
Anthracene	mg/kg	0.1	<0.1	-	-	-
Fluoranthene	mg/kg	0.1	<0.1	-	-	-
Pyrene	mg/kg	0.1	<0.1	-	-	-
Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-	-
Chrysene	mg/kg	0.1	<0.1	-	-	-
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-	-
Benzo(a)pyrene	mg/kg	0.1	<0.1	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-	-
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	-	-	-
Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ	0.2	<0.2	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	-	-	-
Total PAH	mg/kg	0.8	<0.8	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.013 Soil 11 Dec 2014 TP11 0.4-0.5	SE134396A.014 Soil 10 Dec 2014 TP12 0.0-0.1	SE134396A.015 Soil 10 Dec 2014 TP12 0.4-0.5	SE134396A.016 Soil 11 Dec 2014 TP13 0.0-0.1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	**86**	-	-	-
2-fluorobiphenyl (Surrogate)	%	-	**72**	-	-	-
d14-p-terphenyl (Surrogate)	%	-	**100**	-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number: SE134396A.017 Sample Matrix: Soil Sample Date: 11 Dec 2014 Sample Name: TP13 1.9-2.0	SE134396A.018 Soil 11 Dec 2014 TP13 3.5-3.6	SE134396A.019 Soil 11 Dec 2014 TP14 0.0-0.1	SE134396A.020 Soil 11 Dec 2014 TP 14 0.9-1.0
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	<25	-	-	-
TRH C6-C9	mg/kg	20	<20	-	-	-
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	**74**	-	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	**83**	-	-	-
d8-toluene (Surrogate)	%	-	**116**	-	-	-
Bromofluorobenzene (Surrogate)	%	-	**112**	-	-	-
VPH F Bands						
Benzene (F0)	mg/kg	0.1	<0.1	-	-	-
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	-	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403						
TRH C10-C14	mg/kg	20	<20	-	-	-
TRH C15-C28	mg/kg	45	**310**	-	-	-
TRH C29-C36	mg/kg	45	**200**	-	-	-
TRH C37-C40	mg/kg	100	<100	-	-	-
TRH C10-C36 Total	mg/kg	110	**510**	-	-	-
TRH C10-C40 Total	mg/kg	210	**510**	-	-	-
TRH F Bands						
TRH >C10-C16 (F2)	mg/kg	25	<25	-	-	-
TRH >C16-C34 (F3)	mg/kg	90	**460**	-	-	-
TRH >C34-C40 (F4)	mg/kg	120	<120	-	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420						
Naphthalene	mg/kg	0.1	<0.1	-	-	-
2-methylnaphthalene	mg/kg	0.1	<0.1	-	-	-
1-methylnaphthalene	mg/kg	0.1	<0.1	-	-	-
Acenaphthylene	mg/kg	0.1	<0.1	-	-	-
Acenaphthene	mg/kg	0.1	<0.1	-	-	-
Fluorene	mg/kg	0.1	<0.1	-	-	-
Phenanthrene	mg/kg	0.1	**0.1**	-	-	-
Anthracene	mg/kg	0.1	<0.1	-	-	-
Fluoranthene	mg/kg	0.1	<0.1	-	-	-
Pyrene	mg/kg	0.1	<0.1	-	-	-
Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-	-
Chrysene	mg/kg	0.1	<0.1	-	-	-
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-	-
Benzo(a)pyrene	mg/kg	0.1	<0.1	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-	-
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	-	-	-
Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ	0.2	<0.2	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	-	-	-
Total PAH	mg/kg	0.8	<0.8	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.017 Soil 11 Dec 2014 TP13 1.9-2.0	SE134396A.018 Soil 11 Dec 2014 TP13 3.5-3.6	SE134396A.019 Soil 11 Dec 2014 TP14 0.0-0.1	SE134396A.020 Soil 11 Dec 2014 TP 14 0.9-1.0
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	**90**	-	-	-
2-fluorobiphenyl (Surrogate)	%	-	**80**	-	-	-
d14-p-terphenyl (Surrogate)	%	-	**98**	-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.021 Soil 11 Dec 2014 TP14 2.9-3.0	SE134396A.022 Soil 11 Dec 2014 TP14 5.4-5.5	SE134396A.023 Soil 10 Dec 2014 TP15 0.0-0.1	SE134396A.024 Soil 10 Dec 2014 TP15 0.9-1.0
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)	%	-	-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	-	-	-	-
Total PAH	mg/kg	0.8	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.021 Soil 11 Dec 2014 TP14 2.9-3.0	SE134396A.022 Soil 11 Dec 2014 TP14 5.4-5.5	SE134396A.023 Soil 10 Dec 2014 TP15 0.0-0.1	SE134396A.024 Soil 10 Dec 2014 TP15 0.9-1.0
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
Moisture Content Method: AN002							
% Moisture	%	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.025 Soil 11 Dec 2014 TP16 0.0-0.1	SE134396A.026 Soil 11 Dec 2014 TP16 0.6-0.7	SE134396A.027 Soil 11 Dec 2014 TP17 0.0-0.1	SE134396A.028 Soil 11 Dec 2014 TP17 0.9-1.0
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)	%	-		-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2		-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3		-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2		-	-	-	-
Total PAH	mg/kg	0.8		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.025 Soil 11 Dec 2014 TP16 0.0-0.1	SE134396A.026 Soil 11 Dec 2014 TP16 0.6-0.7	SE134396A.027 Soil 11 Dec 2014 TP17 0.0-0.1	SE134396A.028 Soil 11 Dec 2014 TP17 0.9-1.0
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
Moisture Content Method: AN002							
% Moisture	%	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.029 Soil 11 Dec 2014 TP17 2.9-3.0	SE134396A.030 Soil 11 Dec 2014 TP18 0.0-0.1	SE134396A.031 Soil 11 Dec 2014 TP18 0.6-0.7	SE134396A.032 Soil 11 Dec 2014 TP19 0.0-0.1
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)	%	-		-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2		-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3		-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2		-	-	-	-
Total PAH	mg/kg	0.8		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.029 Soil 11 Dec 2014 TP17 2.9-3.0	SE134396A.030 Soil 11 Dec 2014 TP18 0.0-0.1	SE134396A.031 Soil 11 Dec 2014 TP18 0.6-0.7	SE134396A.032 Soil 11 Dec 2014 TP19 0.0-0.1
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)							
Surrogates							
d5-nitrobenzene (Surrogate)	%	-		-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-		-	-	-	-
d14-p-terphenyl (Surrogate)	%	-		-	-	-	-
Moisture Content Method: AN002							
% Moisture	%	0.5		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE134396A.033 Soil 11 Dec 2014 TP19 0.6-0.7	SE134396A.034 Soil 10 Dec 2014 QC7	SE134396A.035 Soil 11 Dec 2014 QC9	SE134396A.036 Water 11 Dec 2014 TB4
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)	%	-		-	-	-	-
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 >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 (as BaP TEQ)- <LOR=0*	TEQ	0.2		-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3		-	-	-	-
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2		-	-	-	-
Total PAH	mg/kg	0.8		-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.033 Soil 11 Dec 2014 TP19 0.6-0.7	SE134396A.034 Soil 10 Dec 2014 QC7	SE134396A.035 Soil 11 Dec 2014 QC9	SE134396A.036 Water 11 Dec 2014 TB4
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	-	-	-	-
2-fluorobiphenyl (Surrogate)	%	-	-	-	-	-
d14-p-terphenyl (Surrogate)	%	-	-	-	-	-
Moisture Content Method: AN002						
% Moisture	%	0.5	-	-	-	-

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.037 Water 11 Dec 2014 TS4	SE134396A.038 Material 10 Dec 2014 TP9 0.0-0.1	SE134396A.039 Soil 11 Dec 2014 TP13 0.9-1.0	SE134396A.040 Soil 11 Dec 2014 TP13 2.9-3.0
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410						
TRH C6-C10	mg/kg	25	-	-	<25	<25
TRH C6-C9	mg/kg	20	-	-	<20	<20
Surrogates						
Dibromofluoromethane (Surrogate)	%	-	-	-	**73**	**71**
d4-1,2-dichloroethane (Surrogate)	%	-	-	-	**80**	**79**
d8-toluene (Surrogate)	%	-	-	-	**109**	**113**
Bromofluorobenzene (Surrogate)	%	-	-	-	**107**	**106**
VPH F Bands						
Benzene (F0)	mg/kg	0.1	-	-	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	-	-	<25	<25
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403						
TRH C10-C14	mg/kg	20	-	-	<20	<20
TRH C15-C28	mg/kg	45	-	-	**67**	**150**
TRH C29-C36	mg/kg	45	-	-	<45	**85**
TRH C37-C40	mg/kg	100	-	-	<100	<100
TRH C10-C36 Total	mg/kg	110	-	-	<110	**240**
TRH C10-C40 Total	mg/kg	210	-	-	<210	**240**
TRH F Bands						
TRH >C10-C16 (F2)	mg/kg	25	-	-	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	-	-	<90	**230**
TRH >C34-C40 (F4)	mg/kg	120	-	-	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420						
Naphthalene	mg/kg	0.1	-	-	<0.1	<0.1
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	-	-	<0.1	<0.1
Acenaphthene	mg/kg	0.1	-	-	<0.1	<0.1
Fluorene	mg/kg	0.1	-	-	<0.1	<0.1
Phenanthrene	mg/kg	0.1	-	-	<0.1	<0.1
Anthracene	mg/kg	0.1	-	-	<0.1	<0.1
Fluoranthene	mg/kg	0.1	-	-	<0.1	<0.1
Pyrene	mg/kg	0.1	-	-	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	-	-	<0.1	<0.1
Chrysene	mg/kg	0.1	-	-	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	-	-	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	-	-	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	-	-	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	-	-	<0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	-	-	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	-	-	<0.1	<0.1
Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ	0.2	-	-	<0.2	<0.2
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	-	-	<0.3	<0.3
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	-	-	<0.2	<0.2
Total PAH	mg/kg	0.8	-	-	<0.8	<0.8

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE134396A.037 Water 11 Dec 2014 TS4	SE134396A.038 Material 10 Dec 2014 TP9 0.0-0.1	SE134396A.039 Soil 11 Dec 2014 TP13 0.9-1.0	SE134396A.040 Soil 11 Dec 2014 TP13 2.9-3.0
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 (continued)						
Surrogates						
d5-nitrobenzene (Surrogate)	%	-	-	-	**92**	**92**
2-fluorobiphenyl (Surrogate)	%	-	-	-	**80**	**80**
d14-p-terphenyl (Surrogate)	%	-	-	-	**100**	**98**
Moisture Content Method: AN002						
% Moisture	%	0.5	-	-	**9.5**	**11**

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.

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

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB070157	mg/kg	0.1	<0.1	0%	118%
2-methylnaphthalene	LB070157	mg/kg	0.1	<0.1	0%	NA
1-methylnaphthalene	LB070157	mg/kg	0.1	<0.1	0%	NA
Acenaphthylene	LB070157	mg/kg	0.1	<0.1	0%	118%
Acenaphthene	LB070157	mg/kg	0.1	<0.1	0%	120%
Fluorene	LB070157	mg/kg	0.1	<0.1	0%	NA
Phenanthrene	LB070157	mg/kg	0.1	<0.1	0%	117%
Anthracene	LB070157	mg/kg	0.1	<0.1	0%	110%
Fluoranthene	LB070157	mg/kg	0.1	<0.1	0%	116%
Pyrene	LB070157	mg/kg	0.1	<0.1	0%	113%
Benzo(a)anthracene	LB070157	mg/kg	0.1	<0.1	0%	NA
Chrysene	LB070157	mg/kg	0.1	<0.1	0%	NA
Benzo(b&j)fluoranthene	LB070157	mg/kg	0.1	<0.1	0%	NA
Benzo(k)fluoranthene	LB070157	mg/kg	0.1	<0.1	0%	NA
Benzo(a)pyrene	LB070157	mg/kg	0.1	<0.1	0%	112%
Indeno(1,2,3-cd)pyrene	LB070157	mg/kg	0.1	<0.1	0%	NA
Dibenzo(a&h)anthracene	LB070157	mg/kg	0.1	<0.1	0%	NA
Benzo(ghi)perylene	LB070157	mg/kg	0.1	<0.1	0%	NA
Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	LB070157	TEQ	0.2	<0.2	0%	NA
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	LB070157	TEQ (mg/kg)	0.3	<0.3	0%	NA
Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	LB070157	TEQ (mg/kg)	0.2	<0.2	0%	NA
Total PAH	LB070157	mg/kg	0.8	<0.8	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB070157	%	-	84%	15%	78%
2-fluorobiphenyl (Surrogate)	LB070157	%	-	80%	21%	76%
d14-p-terphenyl (Surrogate)	LB070157	%	-	98%	8%	86%

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

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB070157	mg/kg	20	<20	100%
TRH C15-C28	LB070157	mg/kg	45	<45	100%
TRH C29-C36	LB070157	mg/kg	45	<45	78%
TRH C37-C40	LB070157	mg/kg	100	<100	NA
TRH C10-C36 Total	LB070157	mg/kg	110	<110	NA
TRH C10-C40 Total	LB070157	mg/kg	210	<210	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH >C10-C16 (F2)	LB070157	mg/kg	25	<25	100%
TRH >C16-C34 (F3)	LB070157	mg/kg	90	<90	93%
TRH >C34-C40 (F4)	LB070157	mg/kg	120	<120	75%

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	LB070169	mg/kg	25	<25	0%	91%	89%
TRH C6-C9	LB070169	mg/kg	20	<20	0%	80%	89%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB070169	%	-	88%	0%	87%	80%
d4-1,2-dichloroethane (Surrogate)	LB070169	%	-	86%	3%	94%	89%
d8-toluene (Surrogate)	LB070169	%	-	119%	1%	123%	108%
Bromofluorobenzene (Surrogate)	LB070169	%	-	111%	7%	121%	101%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB070169	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB070169	mg/kg	25	<25	0%	96%	131%

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.
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.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, 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	Carcinogenic PAHs may be expressed as Benzo(a)pyrene equivalents by applying the BaP toxicity equivalence factor (NEPM 1999, June 2013, B7). These can be reported as the individual PAHs and as a sum of carcinogenic PAHs. The sum is reported three ways, the first assuming all <LOR reults are zero, the second assuming all < LOR results are half the LOR and the third assuming all <LOR results are the LOR.
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

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

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STATEMENT OF QA/QC PERFORMANCE

SE134396A R0

CLIENT DETAILS

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Email	ben@robsonlabs.com.au
Project	**9623 - ESA - Old Canberra Brickworks**
Order Number	(Not specified)
Samples	40

LABORATORY DETAILS

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SGS Reference	SE134396A R0
Report Number	0000099912
Date Reported	09 Jan 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:

Extraction Date	Moisture Content	2 items
	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	4 items
	TRH (Total Recoverable Hydrocarbons) in Soil	4 items
	Volatile Petroleum Hydrocarbons in Soil	4 items

SAMPLE SUMMARY

Sample counts by matrix	4 Soils	Type of documentation received	COC
Date documentation received	06/01/2015@12:34p	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4.7°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

SE134396A 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
TP13 0.9-1.0	SE134396A.039	LB070170	11 Dec 2014	12 Dec 2014	25 Dec 2014	07 Jan 2015†	12 Jan 2015	08 Jan 2015
TP13 2.9-3.0	SE134396A.040	LB070170	11 Dec 2014	12 Dec 2014	25 Dec 2014	07 Jan 2015†	12 Jan 2015	08 Jan 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
TP11 0.4-0.5	SE134396A.013	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 2015
TP13 1.9-2.0	SE134396A.017	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 2015
TP13 0.9-1.0	SE134396A.039	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 2015
TP13 2.9-3.0	SE134396A.040	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 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
TP11 0.4-0.5	SE134396A.013	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 2015
TP13 1.9-2.0	SE134396A.017	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 2015
TP13 0.9-1.0	SE134396A.039	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 2015
TP13 2.9-3.0	SE134396A.040	LB070157	11 Dec 2014	12 Dec 2014	25 Dec 2014	06 Jan 2015†	15 Feb 2015	09 Jan 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
TP11 0.4-0.5	SE134396A.013	LB070169	11 Dec 2014	12 Dec 2014	25 Dec 2014	07 Jan 2015†	16 Feb 2015	09 Jan 2015
TP13 1.9-2.0	SE134396A.017	LB070169	11 Dec 2014	12 Dec 2014	25 Dec 2014	07 Jan 2015†	16 Feb 2015	09 Jan 2015
TP13 0.9-1.0	SE134396A.039	LB070169	11 Dec 2014	12 Dec 2014	25 Dec 2014	07 Jan 2015†	16 Feb 2015	09 Jan 2015
TP13 2.9-3.0	SE134396A.040	LB070169	11 Dec 2014	12 Dec 2014	25 Dec 2014	07 Jan 2015†	16 Feb 2015	09 Jan 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)	TP11 0.4-0.5	SE134396A.013	%	70 - 130%	72
	TP13 1.9-2.0	SE134396A.017	%	70 - 130%	80
	TP13 0.9-1.0	SE134396A.039	%	70 - 130%	80
	TP13 2.9-3.0	SE134396A.040	%	70 - 130%	80
d14-p-terphenyl (Surrogate)	TP11 0.4-0.5	SE134396A.013	%	70 - 130%	100
	TP13 1.9-2.0	SE134396A.017	%	70 - 130%	98
	TP13 0.9-1.0	SE134396A.039	%	70 - 130%	100
	TP13 2.9-3.0	SE134396A.040	%	70 - 130%	98
d5-nitrobenzene (Surrogate)	TP11 0.4-0.5	SE134396A.013	%	70 - 130%	86
	TP13 1.9-2.0	SE134396A.017	%	70 - 130%	90
	TP13 0.9-1.0	SE134396A.039	%	70 - 130%	92
	TP13 2.9-3.0	SE134396A.040	%	70 - 130%	92

Volatile Petroleum Hydrocarbons in Soil

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	TP11 0.4-0.5	SE134396A.013	%	60 - 130%	90
	TP13 1.9-2.0	SE134396A.017	%	60 - 130%	112
	TP13 0.9-1.0	SE134396A.039	%	60 - 130%	107
	TP13 2.9-3.0	SE134396A.040	%	60 - 130%	106
d4-1,2-dichloroethane (Surrogate)	TP11 0.4-0.5	SE134396A.013	%	60 - 130%	84
	TP13 1.9-2.0	SE134396A.017	%	60 - 130%	83
	TP13 0.9-1.0	SE134396A.039	%	60 - 130%	80
	TP13 2.9-3.0	SE134396A.040	%	60 - 130%	79
d8-toluene (Surrogate)	TP11 0.4-0.5	SE134396A.013	%	60 - 130%	106
	TP13 1.9-2.0	SE134396A.017	%	60 - 130%	116
	TP13 0.9-1.0	SE134396A.039	%	60 - 130%	109
	TP13 2.9-3.0	SE134396A.040	%	60 - 130%	113
Dibromofluoromethane (Surrogate)	TP11 0.4-0.5	SE134396A.013	%	60 - 130%	73
	TP13 1.9-2.0	SE134396A.017	%	60 - 130%	74
	TP13 0.9-1.0	SE134396A.039	%	60 - 130%	73
	TP13 2.9-3.0	SE134396A.040	%	60 - 130%	71

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
LB070157.001		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)	%	-	84
		2-fluorobiphenyl (Surrogate)	%	-	80
		d14-p-terphenyl (Surrogate)	%	-	98

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number	Parameter	Units	LOR	Result
LB070157.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result
LB070169.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	88
		d4-1,2-dichloroethane (Surrogate)	%	-	86
		d8-toluene (Surrogate)	%	-	119

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

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134881.001	LB070157.009		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=0*	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR*	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs (as BaP TEQ)- <LOR=LOR/2*	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.4	30	15
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	21
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	8

Volatile Petroleum Hydrocarbons in Soil

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE134396A.040	LB070169.008		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.5	3.5	30	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.9	4.1	30	3
			d8-toluene (Surrogate)	mg/kg	-	5.7	5.7	30	1
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.3	5.0	30	7
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

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 %
LB070157.002		Naphthalene	mg/kg	0.1	4.7	4	60 - 140	118
		Acenaphthylene	mg/kg	0.1	4.7	4	60 - 140	118
		Acenaphthene	mg/kg	0.1	4.8	4	60 - 140	120
		Phenanthrene	mg/kg	0.1	4.7	4	60 - 140	117
		Anthracene	mg/kg	0.1	4.4	4	60 - 140	110
		Fluoranthene	mg/kg	0.1	4.6	4	60 - 140	116
		Pyrene	mg/kg	0.1	4.5	4	60 - 140	113
		Benzo(a)pyrene	mg/kg	0.1	4.5	4	60 - 140	112
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	76
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86

TRH (Total Recoverable Hydrocarbons) in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB070157.002		TRH C10-C14	mg/kg	20	40	40	60 - 140	100
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	100
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	78
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	40	40	60 - 140	100
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	93
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75

Volatile Petroleum Hydrocarbons in Soil

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB070169.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	91
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	80
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.4	5	60 - 140	87
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.7	5	60 - 140	94
		d8-toluene (Surrogate)	mg/kg	-	6.2	5	60 - 140	123
		Bromofluorobenzene (Surrogate)	mg/kg	-	6.0	5	60 - 140	121
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	96

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

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

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE134396A.01	LB070169.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	89
3			TRH C6-C9	mg/kg	20	21	<20	23.2	89
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	3.6	5	80
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	4.2	5	89
			d8-toluene (Surrogate)	mg/kg	-	5.4	5.3	5	108
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	4.5	5	101
		VPH F	Benzene (F0)	mg/kg	0.1	2.4	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	131

MATRIX SPIKE DUPLICATES

SE134396A 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.

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AU.SampleReceipt.Sydney (Sydney)

From: AU.Environmental.Sydney (Sydney)
Sent: Tuesday, 6 January 2015 12:34 PM
To: AU.SampleReceipt.Sydney (Sydney)
Subject: FW: Report Job SE134396, your reference 9623 - ESA - Old Canberra Brickworks
Attachments: 9623_COC_add analysis_20150106.pdf

SGS Ref: SE134396A
Due Date: 09/01/2015
TAT: 3 DAYS.

FYI

Tommy Pieszko
Environmental Services
Client Services Officer
Phone: +61 (0)2 8594 0465
Mobile: +61 (0)2 8594 0499

To provide your valuable feedback & help us to improve, please click here

-----Original Message-----
From: Ben Kendon [mailto:Ben@robsonenviro.com.au]
Sent: Tuesday, 6 January 2015 12:25 PM
To: AU.Environmental.Sydney (Sydney)
Cc: Blackman, Daniel (Sydney)
Subject: RE: Report Job SE134396, your reference 9623 - ESA - Old Canberra Brickworks

Daniel,

I have attached a revised COC for additional analysis of 4 samples for a 72hour TAT which are held by the lab.

Analysis Requested

#13 #39 #17 #40
TRH and PAH - TP11 (0.4-0.5); TP13 (0.9-1.0); TP13 (1.9-2.0); TP13(2.9-3.0).

Any issues please have the lab contact me.

Kind regards,

Ben Kendon

Ben Kendon
Senior Consultant

Robson Environmental
Phone: 02 6239 5656
Mobile: 0437 008 278
Fax: 02 6239 5669
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-----Original Message-----
From: AU.Environmental.Sydney@SGS.com [mailto:AU.Environmental.Sydney@SGS.com]
Sent: Tuesday, 6 January 2015 12:01 PM
To: Ben Kendon; Results
Subject: Report Job SE134396, your reference 9623 - ESA - Old Canberra Brickworks

Dear Ben,

Please find attached the report for SGS job SE134396, your reference 9623 - ESA - Old Canberra Brickworks.

-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,
Trent Ellerington

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All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx

Please refer to page 2 for additional analyses request. Thanks Ben Kendon 6/1/2015.

Robson ENVIRONMENTAL

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No.: 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time: 24hr; 36hr; 48hr; 72hr & 5 to 7 Days

Doc No: BAR-F013 Revision No: 2
Date Issued: 5/11/13
Next Review Date: 05/11/15

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
1	TP8 (0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
.	TP8 (0.4-0.5)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
2	TP8 (0.9-1.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
3	TP8 (1.9-2.0)	10/12/2014		1 plastic bag	soil	ice	Asbestos (WA)	
4	TP8 (2.8-2.9)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA),E coli, Faecal Coliforms and Total Coliforms	
5, ~~BD~~ 38	TP9(0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag + ACM fragments	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
.	TP9(0.5-0.6)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
6	TP9(1.1-1.2)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
.	TP9 (1.9-2.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
7	TP9 (2.9-3.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA) and PAH	
8	TP9 (3.9-4.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
	TP10(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
BH Lab'd 12/12/14	TP10(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	

Relinquished by: RW	Date: 11/12/14		Time: 3pm	Received by:	Time: 12/12/14 9.00
Relinquished by:	Date:		Time:	Received by:	Time:
Relinquished by:	Date:		Time:	Received by:	Time:

RECEIVED
12 DEC 2014
SE139396A

page 1 of 4.

Robson

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 58 008 680 900

Contact: Ben Kondon
Phone: (02) 6239 5656
Mobile: 0437 009 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required: YES NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time: 24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR F013 Revision No. 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN 44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
	TP10(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
10	TP10(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
	TP10(2.9-3.0)	11/12/2014		1 glass jar	soil	ice		Hold
11	TP10(3.9-4.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
	TP10(4.9-5.0)	12/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
12	TP11(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
13 13	TP11(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	TRH, ~~BTEX~~ PAH 72hr TAT.
14	TP12(0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
15	TP12(0.4-0.5)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA)	
16	TP13(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP13(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
39	TP13(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, PAH	Hold 72hr TAT.
17 18	TP13(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	TRH, PAH = 72hr TAT
40	TP13(2.9-3.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		TRH, PAH = 72hr TAT.
18	TP13(3.5-3.6)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
Ph Rcvd 12/12 19	TP14(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	

Relinquished by:RW	Date:11/12/14	Time:	Received by:	Time:	12/12/14 4.00
Relinquished by:	Date:	Time:	Received by:	Time:	
Relinquished by:	Date:	Time:	Received by:	Time:	

Robson

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 930

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax (02) 8594 0499
Email:
ABN 44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
	TP14(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
20	TP14(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA) and PAH	
	TP14(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
21	TP14(2.9-3.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA) and PAH	
	TP14(4.4-4.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
22	TP14(5.4-5.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
23	TP15(0.0-0.1)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP15(0.5-0.6)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
24	TP15(0.9-1.0)	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	
25	TP16(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
26	TP16(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
27	TP17(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA) and CEC, organic carbon, clay content, iron and pH	
	TP17(0.4-0.5)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
28	TP17(0.9-1.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
Rejected	TP17(1.9-2.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice		Hold
29 12/12/14	TP17(2.9-3.0)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	8 heavy metals and asbestos (WA),CEC, organic carbon, clay content, iron and pH	

Relinquished by:RW	Date:11/12/14	Time:	Received by:	Time:	12/12/14 9:00
Relinquished by:	Date:	Time:	Received by:	Time:	
Relinquished by:	Date:	Time:	Received by:	Time:	

page 3 of 4

Robson

Occupational Hygiene Health Safety & Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required YES NO

Job Name: Stage 1 ESA

SGS Job Ref: SY140911-1-IS

Required Turnaround Time: 24hr; 36hr; 48hr; 72hr & 5 to 7 Days

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
30	TP18(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
31	TP18(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
32	TP19(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
33	TP19(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
34	QC7	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
	QC8	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
35	QC9	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
	QC10	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
36	TB4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
37	TS4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
8th Revised 12/12/14								

Relinquished by: RW	Date: 11/12/14	Time:	Received by:	Time:	12/12/14 4:00
Relinquished by:	Date:	Time:	Received by:	Time:	
Relinquished by:	Date:	Time:	Received by:	Time:	

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SGS

SE131396A

Job:

	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	1L 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	40 - Liquid	Storage Location	Bottles Supplied By	Comment	Cooling Method
~~1-38~~ 1-35	S	1		1																			SGS		CP
36	W																2					S190-2 ASB	"	"	Temp
37	W																				1	~~ASB~~ S088	SGS	"	4.7°C
38	M			1																		~~ASB~~ "	"		Good Order
~~35~~	~~SO~~	4																				ASB	Client	—	(Y) / N
																									Clearly Labelled
39-40	S	1		1																		S190-2, ASB		full	(Y) / N
																									Correct Pres.
																									(Y) / N
																									No Head-space
																									(Y) N / NA
																									Sufficient Vol
																									(Y) N
																									Doc Date
																									0661
																									Doc Type
																									COC
																									Complete Docs
																									(Y) N
																									Requested TAT
																									30 DAYS.

~~No soils on hold~~

No soils on hold

SAMPLE RECEIPT ADVICE

SE134396A

CLIENT DETAILS

Contact	Ben Kendon
Client	Robson Environmental Pty Ltd
Address	140 Gladstone Street, FYSHWICK PO Box 112, FYSHWICK ACT 2609
Telephone	(02) 6239 5656
Facsimile	(02) 6239 5669
Email	ben@robsonlabs.com.au
Project	**6923 - ESA - Old Canberra Brickworks**
Order Number	(Not specified)
Samples	40

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 12/12/2014
Report Due	Fri 9/1/2015
SGS Reference	**SE134396A**

SUBMISSION DETAILS

This is to confirm that 40 samples were received on Friday 12/12/2014. Results are expected to be ready by Friday 9/1/2015. Please quote SGS reference SE134396A when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	4 Soils	Type of documentation received	COC
Date documentation received	06/01/2015@12:34pm	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	4.7°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

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS , all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx as at the date of this document.
Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE134369A

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	Volatile Petroleum Hydrocarbons in Soil
013	TP11 0.4-0.5	25	9	8
017	TP13 1.9-2.0	25	9	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

SE134369A

CLIENT DETAILS

Client Robson Environmental Pty Ltd

Project 9623 - ESA - Old Canberra Brickworks

SUMMARY OF ANALYSIS

No.	Sample ID	Moisture Content	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	TRH (Total Recoverable Hydrocarbons) in Soil	Volatile Petroleum Hydrocarbons in Soil
039	TP13 0.9-1.0	1	25	9	8
040	TP13 2.9-3.0	1	25	9	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 .

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

CERTIFICATE OF ANALYSIS 120902

Client:
Robson Environmental Pty Ltd
PO Box 112
Fyshwick
ACT 2609

Attention: Ben Kendon

Sample log in details:

Your Reference:	**9623**		
No. of samples:	2 soils		
Date samples received / completed instructions received	12/12/14	/	12/12/14

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:	19/12/14	/	19/12/14
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

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	120902-1 QC8 10/12/2014 soil	120902-2 QC10 11/12/2014 soil
Date extracted	-	15/12/2014	15/12/2014
Date analysed	-	16/12/2014	16/12/2014
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	109	87

Acid Extractable metals in soil			
Our Reference:	UNITS	120902-1	120902-2
Your Reference	----------	QC8	QC10
Date Sampled	----------	10/12/2014	11/12/2014
Type of sample		soil	soil
Date digested	-	16/12/2014	16/12/2014
Date analysed	-	16/12/2014	16/12/2014
Arsenic	mg/kg	6	9
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	28	14
Copper	mg/kg	17	29
Lead	mg/kg	21	52
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	16	36
Zinc	mg/kg	250	34

Moisture			
Our Reference:	UNITS	120902-1	120902-2
Your Reference	----------	QC8	QC10
Date Sampled	----------	10/12/2014	11/12/2014
Type of sample		soil	soil
Date prepared	-	15/12/2014	15/12/2014
Date analysed	-	16/12/2014	16/12/2014
Moisture	%	8.9	9.1

Asbestos ID - soils			
Our Reference:	UNITS	120902-1	120902-2
Your Reference	----------	QC8	QC10
Date Sampled	----------	10/12/2014	11/12/2014
Type of sample		soil	soil
Date analysed	-	18/12/2014	18/12/2014
Sample mass tested	g	742.90g	735.32g
Sample Description	-	Mustard coarse-grained soil & rocks	Brown fine-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected
ACM >7mm Estimation*	g	--	--
ACM <7mm Estimation*	g	--	--
FA and AF Estimation*	g	--	--
Total Asbestos g/kg*	g/kg	<0.1	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001	<0.001
FA and AF Estimation %(w/w)*	%	<0.001	<0.001
Total Asb Est w/w* Note#	%	<0.001	<0.001

Method ID	Methodology Summary
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** # The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light Microscopy and Dispersion Staining Techniques.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			15/12/2014	[NT]	[NT]	LCS-4	15/12/2014
Date analysed	-			15/12/2014	[NT]	[NT]	LCS-4	15/12/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	87%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	100%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	91%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	91%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	110%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	87%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-4	95%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	104	[NT]	[NT]	LCS-4	101%

Client Reference: 9623

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			16/12/2014	[NT]	[NT]	LCS-6	16/12/2014
Date analysed	-			16/12/2014	[NT]	[NT]	LCS-6	16/12/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-6	106%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-6	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	108%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	96%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-6	96%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-6	99%

Report Comments:

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

Robson ENVIRONMENTAL

Occupational Hygiene
Health Safety &
Environmental Consulting

CHAIN OF CUSTODY FORM

Job No. : 9623

From: Robson Environmental Pty Ltd
PO Box 112 Fyshwick ACT 2609
140 Gladstone Street
Fyshwick ACT 2609
ABN: 55 008 660 900

Contact: Ben Kendon
Phone: (02) 6239 5656
Mobile: 0437 008 278
Fax: (02) 6239 5669
Email: results@robsonenviro.com.au
ben@robsonenviro.com.au

Client Information: Capezio and Co
Unit 2/2 Yallourn Street
Fyshwick ACT 2609

Site Address: Old Canberra Brickworks
Denman Street
Yarralumla ACT 2600

Sampled by: AR

ESDAT Files Required **YES** NO

Job Name: Stage 1 ESA

Required Turnaround Time:
24hr; 36hr; 48hr; 72hr & **5 to 7 Days**

SGS Job Ref: SY140911-1-IS

Doc No: EAR-F013 Revision No: 1
Date Issued: 13/04/2012

To:
SGS
33 Maddox Street
Alexandria NSW 2015

Contact: Matthew
Phone: (02) 8594 0400
Mobile:
Fax: (02) 8594 0499
Email:
ABN:44 000 964 278

Lab ID	Sample ID	Date Sampled	Sample Location	No. of Sample Items	Sample Type	Sample Preservation (Ice, Acid, Ambient)	Analysis Required	Comments
	TP18(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP18(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	Heavy metals and asbestos (WA)	
	TP19(0.0-0.1)	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	TRH, BTEX, PAH, Speciated Phenols, OCP, PCB, 8 heavy metals and asbestos (WA)	
	TP19(0.6-0.7)	11/12/2014		1 glass jar, 1 plastic bag	soil	Ice	Heavy metals and asbestos (WA)	
120902	QC5 7	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
1	QC6 8	10/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
	QC7 9	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	
2	QC8 10	11/12/2014		1 glass jar, 1 plastic bag	soil	ice	PAH, 8 heavy metals and asbestos (WA)	Transfer to Envirolab COC
	TB4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
	TS4	11/12/2014		2 vials	water	ice	BTEX and TRH C6-C9	
RH revised 12/12/14.								

Relinquished by:RW	Date:11/12/14		Time:	Received by: P.Rog 12/12/14	Time: 16.15	
Relinquished by:	Date:		Time:	Received by:	Time:	
Relinquished by:	Date:		Time:	Received by:	Time:	

ENVIROLAB

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

Job No: 120902

Date Received: 12/12/14
~~Time Received:~~ 16 15
Received by: PR
Temp: ~~Cool~~/Ambient
~~Cooling: Ice/Icepack~~
~~Security: Intact~~/Broken/None

Page 4 of 4

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:

Robson Environmental Pty Ltd
PO Box 112
Fyshwick ACT 2609

ph: 02 6239 5656
Fax: 02 6239 5669

Attention: Ben Kendon

Sample log in details:

Your reference:	**9623**
Envirolab Reference:	**120902**
Date received:	12/12/14
Date results expected to be reported:	**19/12/14**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	2 soils
Turnaround time requested:	Standard
Temperature on receipt (°C)	19.2
Cooling Method:	Ice
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

Appendix G

Asbestos Airborne Fibre Monitoring Results

Robson ENVIRONMENTAL
Effective Environmental Solutions

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 13/11/2014 **Report Issued:** 13/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring (Baseline monitoring)

Asbestos Removalist: none

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-1	Lunchroom	0748	1522	1000	100	0.5	< 0.01
9623-2	Perimeter fence south of work area	0803	1520	1000	100	1	< 0.01
9623-3	Perimeter fence southeast of work area	0805	1524	1000	100	1	< 0.01
9623-4	Perimeter fence east of work area	0807	1526	1000	100	0	< 0.01
9623-5	Perimeter fence northeast of work area	0809	1529	1000	100	1	< 0.01
9623-6	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Ben Kendon

NATA
No. 3181

NATA Approved Counter
Ben Kendon

Accredited for compliance with ISO/IEC 17025

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 14/11/2014 **Report Issued:** 14/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring (Baseline monitoring)

Asbestos Removalist: none

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-7	Perimeter fence south of work area	0830	1410	2000	100	1	< 0.01
9623-8	Site office	0835	1409	2000	100	4	< 0.01
9623-9	Perimeter fence south east of work area	0840	1411	2000	100	2	< 0.01
9623-10	Perimeter fence east of work area	0841	1413	2000	100	1	< 0.01
9623-11	Perimeter fence north east corner of work area	0843	1415	2000	100	2	< 0.01
9623-12	Perimeter fence west of work area	0856	1417	2000	100	2	< 0.01
9623-13	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Leo Menssen

NATA
No. 3181

NATA Approved Counter
Leo Menssen

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 17/11/2014 **Report Issued:** 17/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring (Baseline monitoring)

Asbestos Removalist: none

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-14	Crib room	0708	1530	1000	100	1	< 0.01
9623-15	Site office	0709	1515	1000	100	3	< 0.01
9623-16	South of removal area	0713	1517	1000	100	1	< 0.01
9623-17	East of removal area	0718	1519	1000	100	1	< 0.01
9623-18	North of removal area	0721	1521	1000	100	0	< 0.01
9623-19	West of removal area	0725	1526	2000	100	0	< 0.01
9623-20	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Leo Menssen

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Leo Menssen

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 18/11/2014 **Report Issued:** 18/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring (Baseline monitoring)

Asbestos Removalist: none

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-21	Lunchroom	0710	1501	2000	100	0	< 0.01
9623-22	Site office	0712	1504	2000	100	1.5	< 0.01
9623-23	South boundary of removal area	0723	1506	2000	100	0	< 0.01
9623-24	East boundary of removal area	0720	1508	2000	100	0	< 0.01
9623-25	North boundary of removal area	0728	1510	2000	100	0	< 0.01
9623-26	West boundary of removal area	0725	1516	2000	100	0	< 0.01
9623-27	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Andrew Roberts

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NATA Approved Counter
Andrew Roberts

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 19/11/2014 **Report Issued:** 19/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring (Baseline monitoring)

Asbestos Removalist: none

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-28	Crib room	0830	1250	2000	100	0	< 0.01
9623-29	Site office	0832	1452	2000	100	3	< 0.01
9623-30	South boundary of work area	0835	1455	2000	100	2	< 0.01
9623-31	East boundary of work area	0846	1457	2000	100	0	< 0.01
9623-32	North boundary of work area	0842	1500	2000	100	0	< 0.01
9623-33	West boundary of work area	0845	1504	2000	100	0	< 0.01
9623-34	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Andrew Roberts

NATA
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NATA Approved Counter
Andrew Roberts

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 20/11/2014 **Report Issued:** 20/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal area set up

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-35	Crib room	0700	1553	1000	100	2	< 0.01
9623-36	Site office	0705	1555	1000	100	2	< 0.01
9623-37	South boundary of work area	0715	1534	1000	100	0	< 0.01
9623-38	East boundary of work area	0719	1537	1000	100	0	< 0.01
9623-39	North boundary of work area	0723	1544	1000	100	1	< 0.01
9623-40	West boundary of work area	0845	1541	1000	100	0	< 0.01
9623-41	Bob cat cabin (Pump failure)	0745		-	100	1.5	-
9623-42	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Ben Kendon

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 21/11/2014 **Report Issued:** 21/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal area set up and removal of vegetation

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-43	Crib room	0709	1533	1000	100	0	< 0.01
9623-44	Site office	0728	1535	1000	100	3	< 0.01
9623-45	South boundary of work area	0741	1520	1000	100	3	< 0.01
9623-46	East boundary of work area	0750	1510	1000	100	2	< 0.01
9623-47	North boundary of work area	0753	1512	1000	100	2	< 0.01
9623-48	West boundary of work area	0756	1515	1000	100	0	< 0.01
9623-49	Bobcat cabin	0807	1450	1000	100	7.5	<0.01
9623-50	Change/ Clean decon	0813	1523	1000	100	2	<0.01
9623-51	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Ben Kendon

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 24/11/2014 **Report Issued:** 24/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal area set up and removal of vegetation

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-52	Crib room	0757	1450	1000	100	0	< 0.01
9623-53	Site office	0754	1459	1000	100	0	< 0.01
9623-54	Bobcat cabin	0835	1448	1000	100	3	< 0.01
9623-55	South boundary of work area	0807	1502	1000	100	0	< 0.01
9623-56	East boundary of work area	0812	1427	1000	100	0	< 0.01
9623-57	North boundary of work area	0817	1429	1000	100	0	< 0.01
9623-58	West boundary of work area	0827	1432	1000	100	0	< 0.01
9623-59	Change/ Clean decon	0840	1445	1000	100	0	< 0.01
9623-60	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Anne Robson

NATA
No. 3181

NATA Approved Counter
Anne Robson

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 25/11/2014 **Report Issued:** 25/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal area set up and removal of vegetation

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-61	Lunch room	0702	1521	1000	100	0	< 0.01
9623-62	Site office	0704	1523	1000	100	0	< 0.01
9623-63	West boundary of removal area	0709	1508	1000	100	0	< 0.01
9623-64	North boundary of Exclusion area	0713	1510	1000	100	0	< 0.01
9623-65	East boundary of removal area	0715	1513	1000	100	0	< 0.01
9623-66	South east boundary of Exclusion area	0718	1515	1000	100	0	< 0.01
9623-67	South boundary of removal area	0720	1516	1000	100	3	< 0.01
9623-68	Bobcat cabin	0830	1518	1000	100	4.5	< 0.01
9623-69	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Anne Robson

NATA
No. 3181

NATA Approved Counter
Anne Robson

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 26/11/2014 **Report Issued:** 26/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal area set up and removal of vegetation

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-70	Lunch room	0729	1511	1000	100	0	< 0.01
9623-71	Site office	0730	1512	1000	100	3	< 0.01
9623-72	West boundary of removal area	0747	1530	1000	100	0	< 0.01
9623-73	North boundary of removal area	0746	1528	1000	100	0	< 0.01
9623-74	East boundary of removal area	0745	1532	1000	100	0	< 0.01
9623-75	South east boundary of removal area	0731	1515	1000	100	0	< 0.01
9623-76	Bobcat cabin	0732	1517	1000	100	2	< 0.01
9623-77	Hitachi excavator cabin	0720	1535	1000	100	0	< 0.01
9623-78	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Anne Robson

NATA
No. 3181

NATA Approved Counter
Anne Robson

Accredited for compliance with ISO/IEC 17025

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 27/11/2014 **Report Issued:** 27/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal of vegetation

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-79	Lunch room	0717	1505	1000	100	0	< 0.01
9623-80	Site office	0719	1507	1000	100	2	< 0.01
9623-81	West boundary of removal area	0730	1520	1000	100	0	< 0.01
9623-82	North boundary of removal area	0727	1522	1000	100	0	< 0.01
9623-83	East boundary of removal area	0724	1512	1000	100	0	< 0.01
9623-84	South boundary of removal area	0720	1510	1000	100	1	< 0.01
9623-85	Excavator cabin (Hitachi)	0705	1525	1000	100	0	< 0.01
9623-86	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Andrew Roberts

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No. 3181

NATA Approved Counter
Andrew Roberts

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 28/11/2014 **Report Issued:** 28/11/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal of vegetation and ACM impacted soils

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-87	Lunch room	0725	1502	1000	100	0	< 0.01
9623-88	Site office	0720	1500	1000	100	1	< 0.01
9623-89	West boundary of removal area	0735	1512	1000	100	0	< 0.01
9623-90	North boundary of removal area	0738	1514	1000	100	0	< 0.01
9623-91	East boundary of removal area	0729	1506	1000	100	2	< 0.01
9623-92	South boundary of removal area	0715	1505	1000	100	2	< 0.01
9623-93	Excavator cabin (Hitachi)	0712	1538	1000	100	2	< 0.01
9623-94	Decontamination Unit	0907	1540	2000	100	2	< 0.01
9623-95	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 1/12/2014 **Report Issued:** 1/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal of vegetation and ACM impacted soils

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-96	Lunch room	0708	1435	1000	100	0	< 0.01
9623-97	Site office	0711	1423	1000	100	0	< 0.01
9623-98	West boundary of removal area	0723	1425	1000	100	1	< 0.01
9623-99	North boundary of removal area	0727	1427	1000	100	0	< 0.01
9623-100	East boundary of removal area	0715	1431	1000	100	1	< 0.01
9623-101	South boundary of removal area	0713	1428	1000	100	2	< 0.01
9623-102	Decontamination Unit	0720	1440	2000	100	0	< 0.01
9623-103	Excavator cabin (Hitachi)	0702	1414	1000	100	0	< 0.01
9623-104	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 2/12/2014 **Report Issued:** 2/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Removal of vegetation and ACM impacted soil

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-105	Lunch room	0750	1450	1000	100	2	< 0.01
9623-106	Site office	0750	1442	1000	100	1	< 0.01
9623-107	West boundary of removal area	0808	1455	1000	100	0	< 0.01
9623-108	North boundary of removal area	0805	1452	1000	100	0	< 0.01
9623-109	East boundary of removal area	0758	1447	1000	100	8	< 0.01
9623-110	South boundary of removal area	0748	1437	1000	100	0	< 0.01
9623-111	Decontamination Unit	0752	1444	2000	100	4	< 0.01
9623-112	Excavator cabin (Hitachi)	0745	1439	1000	100	1	< 0.01
9623-113	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Ben Kendon

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Ben Kendon

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 3/12/2014 **Report Issued:** 3/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Stockpiling of ACM materials

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-114	Lunch room	0735	1428	1000	100	2.5	< 0.01
9623-115	Site office	0730	1430	1000	100	4.5	< 0.01
9623-116	West boundary of removal area	0735	1421	1000	100	1.5	< 0.01
9623-117	North boundary of removal area	0742	1422	1000	100	0	< 0.01
9623-118	East boundary of removal area	0734	1423	1000	100	0	< 0.01
9623-119	South boundary of removal area	0715	1425	1000	100	0	< 0.01
9623-120	Decontamination Unit	0711	1426	2000	100	3	< 0.01
9623-121	Excavator cabin (Hitachi)	0708	1417	1000	100	1	< 0.01
9623-122	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 4/12/2014 **Report Issued:** 4/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring during soil sampling

Asbestos Removalist: None

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-123	Lunch room	0746	1506	1000	100	2.5	< 0.01
9623-124	Site office	0748	1507	1000	100	1	< 0.01
9623-125	West boundary of removal area	0815	1502	1000	100	0	< 0.01
9623-126	North boundary of removal area	0817	1500	1000	100	1	< 0.01
9623-127	East boundary of removal area	0810	1510	1000	100	0	< 0.01
9623-128	South boundary of removal area	0808	1511	1000	100	0	< 0.01
9623-129	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 8/12/2014 **Report Issued:** 8/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Asbestos in soil removal

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-130	Lunch room	0719	1439	1000	100	0	< 0.01
9623-131	Site office	0721	1441	1000	100	2	< 0.01
9623-132	West boundary of removal area	0725	1450	1000	100	2	< 0.01
9623-133	North boundary of removal area	0730	1448	1000	100	1	< 0.01
9623-134	East boundary of removal area	0723	1443	1000	100	1	< 0.01
9623-135	South boundary of removal area	0714	1443	1000	100	0	< 0.01
9623-136	Excavator cabin (Hitachi)	0707	1438	1000	100	1	< 0.01
9623-137	Decontamination Unit	0717	1440	1000	100	1	< 0.01
9623-138	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Andrew Roberts

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 9/12/2014 **Report Issued:** 9/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Asbestos in soil removal and soil sampling

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-139	Site Office	0705	1447	1000	100	3	< 0.01
9623-140	Lunchroom	708	1449	1000	100	0	< 0.01
9623-141	West boundary of removal area	0724	1504	1000	100	0	< 0.01
9623-142	North boundary of removal area	0726	1503	1000	100	1	< 0.01
9623-143	East boundary of removal area	0714	1454	1000	100	0	< 0.01
9623-144	South boundary of removal area	0714	1451	1000	100	1	< 0.01
9623-145	Decontamination Unit	0719	1456	1000	100	3	< 0.01
9623-146	Excavator cabin (Hitachi)	0709	1445	1000	100	1	< 0.01
9623-147	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 10/12/2014 **Report Issued:** 10/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Asbestos removal and soil sampling

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-148	Lunch room	0707	1529	1000	100	0	< 0.01
9623-149	Site office	0709	1527	1000	100	0	< 0.01
9623-150	West boundary of removal area	0729	1535	1000	100	1	< 0.01
9623-151	North boundary of removal area	0730	1540	1000	100	1	< 0.01
9623-152	East boundary of removal area	0715	1532	1000	100	2	< 0.01
9623-153	South boundary of removal area	0713	1531	1000	100	0	< 0.01
9623-154	Decontamination Unit	0725	1525	1000	100	4	< 0.01
9623-155	Excavator cabin (Hitachi)	0721	1533	1000	100	0	< 0.01
9623-156	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 11/12/2014 **Report Issued:** 11/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Soil sampling

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-157	Site office	0700	1453	1000	100	2	< 0.01
9623-158	Lunch room	0701	1455	1000	100	2	< 0.01
9623-159	West boundary of removal area	0706	1502	1000	100	0	< 0.01
9623-160	North boundary of removal area	0707	1500	1000	100	1	< 0.01
9623-161	East boundary of removal area	0718	1457	1000	100	0	< 0.01
9623-162	South boundary of removal area	0722	1456	1000	100	2	< 0.01
9623-163	Decontamination Unit	0724	1449	1000	100	0	< 0.01
9623-164	Excavator cabin (Hitachi)	Fault	Fault	Fault	100	1*	N/A
9623-165	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

Fault = Air monitor battery failure
***= Fibre count only**

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 12/12/2014 **Report Issued:** 12/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Trenching

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-166	Site office	0703	1502	1000	100	0	< 0.01
9623-167	Lunch room	0704	1505	1000	100	0	< 0.01
9623-168	West boundary of removal area	0709	1513	1000	100	0	< 0.01
9623-169	North boundary of removal area	0711	1511	1000	100	0	< 0.01
9623-170	East boundary of removal area	0707	1505	1000	100	1	< 0.01
9623-171	South boundary of removal area	0705	1507	1000	100	0	< 0.01
9623-172	Decontamination Unit	0713	1515	1000	100	0	< 0.01
9623-173	Excavator cabin (2nd Hitachi)	0718	1503	1000	100	0	<0.01
9623-174	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

Robson Approved Signatory
Andrew Roberts

NATA
No. 3181

NATA Approved Counter
Andrew Roberts

Accredited for compliance with ISO/IEC 17025

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards

Robson ENVIRONMENTAL
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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 15/12/2014 **Report Issued:** 15/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Wood Chipping

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-175	Site office	0702	1609	1000	100	1	< 0.01
9623-176	Lunch room	0710	1611	1000	100	1	< 0.01
9623-177	West boundary of removal area	0719	1617	1000	100	0	< 0.01
9623-178	North boundary of removal area	0721	1616	1000	100	0	< 0.01
9623-179	East boundary of removal area	0715	1628	1000	100	3	< 0.01
9623-180	South boundary of removal area	0712	1612	1000	100	0	< 0.01
9623-181	Decontamination Unit	0740	1603	1000	100	1	< 0.01
9623-182	Excavator cabin (Wood chipping company)	0726	1608	1000	100	3	<0.01
9623-183	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 16/12/2014 **Report Issued:** 16/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Background air monitoring

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-184	Site office	0714	1510	1000	100	5	< 0.01
9623-185	Lunch room	0716	1509	1000	100	0	< 0.01
9623-186	West boundary of removal area	0719	1520	1000	100	0	< 0.01
9623-187	North boundary of removal area	0721	1522	1000	100	1	< 0.01
9623-188	East boundary of removal area	0734	1514	1000	100	0	< 0.01
9623-189	South boundary of removal area	0740	1515	1000	100	0	< 0.01
9623-190	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 17/12/2014 **Report Issued:** 17/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Surface sealing and mulch distribution

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-191	Site office	0727	1509	2000	100	7	< 0.01
9623-192	Lunch room	0730	1505	2000	100	2	< 0.01
9623-193	West boundary of work area	0737	1555	2000	100	2	< 0.01
9623-194	North boundary of work area	0740	1558	2000	100	0	< 0.01
9623-195	East boundary of work area	0745	1549	2000	100	6	< 0.01
9623-196	South boundary of work area	0746	1546	2000	100	10	< 0.01
9623-197	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Respirable Fibre Estimation Test Report

Report No.: 9623 **Sampling Date:** 18/12/2014 **Report Issued:** 18/12/2014

Monitoring Location: Canberra Brickworks Remediation Project, Denman Street Yarralumla ACT 2600 (Block 1 Section 102 Yarralumla)

Client Name & Address: Capezio and Co Unit 2/2 Yallourn Street Fyshwick ACT 2609

Work in Progress: Mulch distribution

Asbestos Removalist: AAC

Test Specification(s) Employed: NOHSC: Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC: 3003 (2005)], & In-House Procedure No. 1

Sample No.	Sampling Location	Time On	Time Off	Av. Flowrate	No. of Fields Counted	No. of Fibres Counted	Airborne Fibre Conc. (fibres/mL)
9623-198	Site office	0705	1334	2000	100	13	< 0.01
9623-199	Lunch room	0708	1335	2000	100	2	< 0.01
9623-200	West boundary of work area	0714	1338	2000	100	0	< 0.01
9623-201	South boundary of work area	0716	1340	2000	100	0	< 0.01
9623-202	East boundary of work area	0720	1343	2000	100	0	< 0.01
9623-203	North boundary of work area	0722	1345	2000	100	2	< 0.01
9623-204	Field blank	-	-	-	100	0	-

Field blanks and samples taken in direct flow of negative air units are reported as a fibre count only

The Detection Limit of the analytical method is 0.01 fibres/mL
The *NOHSC: 2002 (2005)* recommended Control Level for all forms of asbestos is 0.01 fibres/mL
Worksafe Australia's recommended Exposure Standard for all forms of asbestos is 0.1 fibres/mL

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Appendix H

Robson Standard Operating Procedures

(SOP003 and SOP009)

Document Approval

Document Owner	EAR Manager
Checked By	Managing Director
Approved By	Managing Director

History of Amendments

Revision Number	Date	Clause	Summary of Amendments
0	17/08/2010		Original
1	30/08/2012		Minor Changes Throughout Document
2	6/06/2014		Minor updates to header and footer only

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1 INTRODUCTION

1.1 Purpose

The purpose of this Standard Operating Procedure (SOP) is to document standard protocols for Robson environmental scientists, engineers and technicians for the sampling, field analysis, containment and preservation of soil samples. It is considered that following the recommended protocols will assist with the following:

- To ensure that the samples are representative of the soil medium from where they are collected;
- To preserve the representative nature of the sample until analytical determinations and/or measurements are made;
- To provide accurate and consistent determination of chemical, physical and biological indicators of the soil sampled; and
- To provide representative samples to facilitate observation and logging of the subsurface conditions.

1.2 Scope

The scope of this SOP is the collection and handling of soil samples for field and/or laboratory analysis of chemical, physical and/or biological properties. The procedures apply to the preparation and fieldwork for baseline assessments and contaminated site assessments. The SOP is applicable to the Project Manager designing and supervising the sampling program, and for environmental scientists, engineers and technicians implementing the sampling program in the field.

2 PREPARATION AND EQUIPMENT

2.1 Preparation

- Review job proposal and Sampling and Analysis Quality Plan (SAQP). If a SAQP is required then this should have been prepared by the Project Manager prior to the sampling event;
- Contact the laboratory to confirm that they are able to undertake required analysis, that they have capacity to undertake the analysis within the required timeframe, and to establish any specific sample size / preservation requirements;
- Organise site information including the following:
  - Site access including permissions, directions to the site and site access roads, site access keys,
  - Contact names, addresses and phone numbers;
  - Site map showing sampling locations;
- Organise and check equipment. This includes the following:
  - Test and recharge/replace batteries as necessary;
  - Check the instruments' ability to calibrate and function properly;
  - Inspect the equipment for defects, loose or frayed wires and that cables are in good condition etc;
  - Check that all equipment is properly decontaminated and stored for transport;
- Organise sampling equipment. This could include the following items:
  - Field sheets, writing equipment, waterproof markers,
  - Calculator, stopwatch, camera and telephone;
  - Instruments including photoionisation detector (PID) and Lower Explosive Limit (LEL) meter;
  - Measuring wheel;
  - Plastic sheet or ground cover;
  - Decontamination equipment include non-phosphate cleaner (e.g. Decon 90), scrubbing brushes, wash and rinse buckets, wastewater containers, deionised / demineralised water and potable tap water;
  - Sample collection devices such as trowels, hand augers, stainless steel mixing bowls, paper towelling and zip lock plastic bags;
  - Sample jars and bags for analysis required (plus extras for replacements if needed), eskies, ice, ice blocks, bubble wrap and 'Fragile' adhesive tape;
  - Tools including wrench, screw driver, pliers, knife, duct tape and hammer; and
  - Personal Protective equipment including disposable gloves, leather gloves, safety glasses, safety mask/splash shield, overalls, hard hat, steel cap boots, rubber boots with steel caps, high visibility clothing, first aid kit; filter marks (and that cartridges are within use by date), ear muffs / plugs;

- Antiseptic handwash;
- Suitable bags for disposal of generated wastes; and
- Material safety data sheets (MSDS) for all chemicals brought onto site.

2.2 Preparatory Work On Site

- Obtain all necessary permits required prior to intrusive works (eg DBYD and underground services clearance, hot works permits, AIP Work Clearance for Contractors form);
- Where necessary, contact the Client or site contact to confirm arrangements, identify specific site issues and / or undertake site inductions;
- Induct all Robson personnel and sub-contractors onto the site using the pre-prepared and site specific Site Safety Management Plan (SSMP);
- Mark out the proposed sample locations. If the sample locations have been pre-identified in the office, then their location in the field is generally identified using either a GPS or by measurement from an obvious reference point using a measuring wheel or tape measure. In specified circumstances, locations may need to be identified using a registered surveyor – if this is required then the Project Manager should have already made appropriate arrangements. Confirm that the locations correlate with those on the sampling plan. Adjust if necessary and record;
- If the sampling locations are to be determined in the field then ensure that their locations and density meets the specific requirements of the assessment. Measure the position of these locations either relative to an obvious and permanent reference point or with a GPS;
- Where necessary, confirm that required materials and / or equipment has been delivered to the site (eg drums, sampling consumables etc); and
- Clear proposed sample location for underground utilities and services. This will require engagement of a Telstra approved underground services locator. The Robson site supervisor should communicate one on one with the underground services locator about each proposed sample location. Note that depending upon the site, the Client may already have removed all services or already had all underground services located.

3 CALIBRATION AND USE OF PID AND LEL

3.1 PID Screening

Each soil sample collected should be screened in the field with a hand held Photo-ionisation Detector (PID) for the presence of volatile organic compounds (VOCs). The results of the PID screening provide an indication of the potential for hydrocarbon impact. Robson own a MiniRae® 2000 and MiniRae® 3000 PID which have a 10.6 electron volt (eV) self cleaning lamp with a total detection range of 0 parts per million (ppm) to 10,000 ppm.

3.1.1 PID Screening of Soil Samples

Use consistency with the methods for screening, particularly the sample containers used (eg size and type of zip lock bag, amount of soil in the container and the amount of time that the sample sits before screening with the PID). Note that the PID may be subject to poor performance in the presence of high humidity or when screening moist / wet samples.

The following PID screening procedures should be used for the MiniRae® 2000. Please note that the procedures are the same for the MiniRae® 3000 however the screen instructions and buttons do vary slightly::

- The PID should be calibrated daily prior to use. Further guidance regarding the calibration of the PID is provided in **Section 3.1.2**. Check that the PID maintenance register indicates recent service. The battery should also be recharged prior to use. A fully charged battery runs the PID continuously for approximately 10 hours;
- Allow the PID unit to equilibrate with the surrounding environmental temperature;
- Start up the PID unit. To turn on, press the **MODE** key for 1 second and release. The audio buzzer will beep once and the air pump will turn on. A range of LCD displays are then shown during the start up process. Once the start up process is complete, the unit will display the message 'Ready...'. Pressing the **Y/+** button will now allow the unit to take a PID measurement;
- Attached a water trap filter onto the PID intake tube (to prevent water and dust from being sucked into the sensor manifold which could cause extensive damage to the monitor);
- Screen an empty zip lock bag with the PID prior to use to confirm that the bag type does not release VOCs that may be picked up by the PID;
- The soil sample to be screened should be placed in a clean zip lock bag. Ensure that enough air space (head space) is present above the soil. The zip lock should then be sealed;
- Shake the sample container to thoroughly mix the soil sample with the air in the head space.
- Let the sample equilibrate – it is normally sufficient to allow the sample to sit for a couple of minutes prior to screening. Do not allow the samples to sit in the sun;
- Open a small section of the zip lock sufficient to allow insertion of the tip of the PID intake tube. Alternatively, puncture the side of the upper part of the bag with the tip of the PID. Insert the intake tube through the opening and into the head space;

- Screen the sample for at least 5 seconds. Record the highest PID reading registered on the field form titled 'Field Screening of Soil / Materials'. Also provide a qualitative description of any odours noted;
- Ensure that dirt and moisture are not sucked into the PID probe. Do not ever immerse the intake tube in liquids;
- When the display shows a flashing message 'Bat', the battery requires recharging;
- Following a series of 0 ppm readings, verify that the PID unit is actually working by screening a sample with known volatiles, or by testing with the standard reference span gas used for calibration; and
- To turn off the PID, press and hold the **MODE** key for 5 seconds. The monitor will beep once per second during the power-down sequence. The message 'OFF!.." flashes on the LCD display and then the display will go blank indicating that the monitor is turned off. Detach the water trap filter.

3.1.2 Calibration of the MiniRae® 2000/ MiniRae® 3000 PID Unit

Calibration of the MiniRae® 2000/ MiniRae® 3000 PID unit is a two point process. That is, calibration firstly involves setting the zero point for the sensor by reference against fresh air which contains no detectable VOC (0.0 ppm). The sensor is then set against a second point of reference using a standard reference gas of known concentration (typically Span Gas – with an Isobutylene concentration of 100 ppm).

During calibration, be sure to complete the PID section of the form 'Calibration Register (Field Equipment)'.

Once the PID unit has been turned on, calibration is undertaken via entering the Programming Mode of the unit. To enter the programming mode, press and hold down simultaneously both the **N/-** and **MODE** keys for 3 seconds. Press the **N/-** key to scroll to the next menu item of the programming mode, and the **Y/-** key to select the displayed menu item.

<u>Fresh Air Calibration</u>

- Undertake the fresh air calibration in an area where no odours are noted. If in doubt, attach an charcoal vapour zeroing filter onto the PID intake tube. In the 'Fresh air Cal?' sub-menu of programming mode press the **Y/-** key. The LCD display will then read 'zero in progress', followed by 'wait....', and a countdown timer; and
- After about 15 seconds the display will read 'update data...zeroed...reading – X.X ppm...'. Press any key or wait 20 seconds for the monitor to return back to the 'Fresh air Cal?' sub-menu. Remove the charcoal vapour zeroing filter from the PID intake tube.

Reference Point Calibration

- Now undertake the second reference point calibration using the span gas. Press the **N/-** key to scroll from the 'Fresh air Cal?' sub-menu to the 'Span Cal?' sub-menu;
- Attach the PID intake tube to a cylinder of standard reference gas (Span Gas – with an Isobutylene concentration of 100 ppm) which has been fitted with a 500 cc/minute flow-limiting regulator;
- Press the **Y/-** key to start the calibration. The display shows the gas name and the span value of the corresponding gas. The display will then read 'Apply gas now!'. Turn on the valve of the span gas;
- The unit will then perform the calibration – during this period the display will read 'wait....30' with a count down timer of the remaining seconds until calibration is complete. When the count down timer reaches '0', the display reads the calibrated value. This should be very close to the known concentration of the span reference gas;
- The unit will then read 'Update Data Span Cal Done! Turn Off Gas'. Turn off the flow of the span reference gas and disconnect from the PID unit;
- Press any key to return back to the 'Span Gas Cal?' sub-menu; and
- To exit the Programming Mode (that is, return to screening operation), press the **MODE** key once at any of the programming menu displays.

3.2 LEL Screening

LEL refers to the Lower Explosive Limit which is the explosive limit of a gas or a vapour is the lowest concentration (percentage) of a gas or a vapour in air capable of producing a flash of fire in presence of an ignition source (arc, flame, heat). At concentrations in air below the LEL there is not enough fuel to continue an explosion. That is, concentrations lower than LEL are 'too lean' to burn. Each combustible gas has its own LEL concentration; this information can be sourced from the MSDS for the chemicals of concern.

Robson uses the Industrial Scientific 'MX6 Ibrid'™ multi-gas monitor for the screening of levels of oxygen, toxic and combustible gas, and VOCs. The following information is sourced from the LEL operation manual titled Industrial Scientific (2009) '*MX6 iBrid Multi-Gas Monitor Operation Guide*'.

3.2.1 Use of the MX6 Ibrid™ LEL Unit

The following LEL screening procedures should be used:

- Prior to each day's use, a zero calibration and a functional 'bump test' should be performed on the LEL. If the LEL does not pass the bump test, then a full calibration is required. Further information regarding zero calibration and a bump test is provide below in **Section 3.2.2**;
- Start up the LEL unit. To turn on, locate, press and hold the centre **ENTER** navigation button for at least 3 seconds. A series of LCD displays are then shown during the start up process. Once the start up process is complete, the unit will display the Normal Operation Mode screen. The screen layout is dependent upon the number of sensors that are actually installed;

- On the Normal Operation Mode screen, sensor names are displayed in solid black text, and blinking black text during alarm conditions. In addition, the sensor readings are displayed as solid black numbers during normal operation, and solid red numbers during alarm conditions;
- To turn off the LEL, press and hold the centre **ENTER** key for more than 2 seconds. A confirmation screen is displayed to provide verification of the shut down.

The LEL is powered by an internal rechargeable battery which should be fully recharged before use. Follow these steps to charge the battery:

- Insert the power cord of the charging cradle into a power point;
- Place the LEL in the cradle; and
- Confirm that the LCD on the LEL shows that the battery is charging.

The battery status can be confirmed by accessing the Battery Status screen. To do this from the Normal Operation Mode screen, press and release the centre **ENTER** button. Under the Main Menu, use the arrow buttons to highlight the VIEW option, and then highlight the Battery option under the VIEW option. The Battery Status screen then shows the approximate percentage (%) of battery charge remaining. Note that if the battery life remaining is less than 1 hour, the battery icon flashes on the Normal Operation Mode screen and an audible low battery alarm is emitted. If the running time is less than 10 minutes, then the LEL notifies of impending unit shut down by showing 'Low Battery' on the lower central part of the screen.

Verify the calibration of the combustible gas sensor after any incident where the combustible gas content has caused the instrument to display an over-range condition.

Sensor openings and water barriers must be kept clean. Obstruction of the sensor openings and/or contamination of the water barriers may cause readings to be lower than actual gas concentrations.

3.2.2 Zero Calibration and LEL Bump Test and Calibration Unit

Prior to each day's use, a zero calibration and a functional 'bump test' on the LEL should be performed. The zero calibration involves exposing the LEL to a fresh air environment, whereas the Bump Test involves brief exposure of the LEL to a concentration of gas(es) in excess of the lowest alarm set point for each sensor for the purpose of verifying sensor and alarm operation. Note that the bump test is not intended to be a measure of the accuracy of the instrument. If the LEL does not pass the bump test, then a full calibration is required.

The following describes the procedure for undertaking a zero calibration:

- Zero calibrate instrument in fresh air environment. Attach the RAE system zero filter shown below in Figure 1, and remove the black cap on the end;



Figure 1: Zero Calibration Set Up

- Press **ENTER**, **SENSOR**, **ZERO ALL** and then **OK**. The instrument will run through a series of check and beep when complete. Make sure that you reattach the black cap to zero filter when finished.

The following describes the procedure for undertaking a Bump Test:

- Access the Main Menu from the Normal Operation Mode screen by pressing and then releasing the centre **ENTER** button. Under the Main Menu, use the arrow buttons to highlight the Sensor option, and then highlight the Bump Test option under the Sensor option;
- If the Bump Test option is selected a confirmation screen is shown displaying 'Bump Test All Sensors?'. If **OK** is selected then all the installed sensors are bump tested, starting with the first sensor. If **CANCEL** is selected, then the LEL returns to the Normal Operation Mode screen;
- If the user has selected **OK**, then a screen advises the user to apply a specific gas to the LEL. The user must then apply the gas and select **START** before the bump times out.
    - If the user selects **START**, the bump test is started for this sensor. Attach the grey Industrial Scientific gas cylinder to the inlet on instrument as shown below in Figure 2, making sure to use the tubing supplied with the MX6 because it has a flow regulator to adjust gas delivery (Figure 3). The sensor must reach a gas reading of 50% or greater of the applied gas concentration within 60 seconds to pass. Once the sensor has done so, the word 'pass' is displayed for 3 seconds before the instrument moves on to the next sensor.



Figure 2: Bump Test Set Up



Figure 3: Supplied Tubing

    - If the user selects **SKIP**, then the bump test for this gas is not done and the instrument moves on to the next sensor in the list to be tested;
- After all the sensors installed on the LEL instrument have been bump tested, the LEL instrument will beep and give a pass or fail reading for each sensor. The user must

acknowledge this screen by selecting **OK** to return to the main Normal Operation Mode screen;

- If a sensor fails, the instrument will ask to whether to continue or to calibrate the failed sensor(s). If **CANCEL** is selected then the sensor is not calibrated and the LEL instrument moves on to the next sensor on the list. If the user selected **OK**, then the LEL calibrates the failing sensor. This step is repeated until the user has chosen to calibrate all failed sensors.

Calibration of the LEL is undertaken using the following procedure:

- To calibrate press **ENTER**, **SENSOR** and then **CALIBRATE**. Attach a RAE zero filter (Figure 4). Select **OK** to confirm calibration. The screen will show the message 'sensor zeroing', followed by an O_2 calibration;



Figure 4: Zero Filter Set Up

- When screen prompt appears to calibrate isobutylene, attach the yellow RAE gas cylinder to the inlet on the top of the instrument using the tubing supplied (Figure 5).



Figure 5: Isobutylene Calibration

The calibration will automatically begin when the instrument detects the gas (5 minute timeout period to attach gas supply). When the isobutylene sensor calibration is complete, a prompt to skip or abort the H_2S sensor will appear. Turn off the canister valve and detach from inlet;

- Attach the grey Industrial Scientific mixture gas cylinder (Figure 6).



Figure 6: CO, H_2S & LEL% Calibration

The instrument will automatically start calibrating the remaining sensors. Select **SKIP** to skip a sensor or **ABORT** to abort the calibration; and

- When the calibration is complete the instrument will show a 'pass', 'marginal' or 'fail' reading for each sensor. The screen will automatically revert to the main Normal Operation Mode screen if no options are selected.

4 TYPES OF SOIL SAMPLES AND SAMPLE COLLECTION

4.1 Soil Sample Types

Soil samples are commonly obtained from one or more of the following:

- Surface sampling;
- Test pits; and/or
- Boreholes.

From the various sampling methods, two main types of soil samples are collected:

- Disturbed samples – these are samples where the soil has been disturbed loosing its' natural soil structure, physical properties and/or moisture. Disturbed samples are generally collected from grab sampling methods such as during auger or hammer drilling, when sampling from test pits or from the walls/base of excavations or from stockpiles;
- Undisturbed samples – these are samples where the sampled soil remains more-or-less in its' undisturbed state, retaining its' natural soil structure, physical properties and/or moisture. Undisturbed samples can be collected by push tube sampling methods or during core drilling.

A number of different excavation and boring methods are available, however the choice of method requires consideration of the following:

- Objective of assessment and depth of assessment works;
- Site access, ground conditions and acceptable site disturbance;
- Nature of potential contaminants and sample volume required; and
- Type of sample required (e.g. disturbed or undisturbed).

In addition to the above, samples can either be discrete samples or composite samples. Discrete samples are samples collected over a discrete sampling interval which are representative of that interval, but based on observations may also be representative of the surrounding soils. Composite samples comprise a sample which is made up of several sub-samples from a range of locations, material types or depth intervals. Though compositing does have benefits in certain situations (e.g. potential lower screening costs of larger areas), as a general rule Robson does not recommend the collection of composite samples for the following reasons:

- The composite sample is representative only of the composite sample. That is, actual contaminant concentrations may be higher than laboratory results in some sub-samples and lower in other sub-samples;
- The physical mixing process to form the composite sample may inadvertently release some of the volatile contaminants (if present); and
- If a contaminant concentration exceeds the adjusted assessment criteria (that is, the adjusted criteria is the soil criteria divided by the number of samples comprising the composite), then each of the discrete samples making up the composite should be

analysed. This prolongs the duration of the assessment and increases the analytical costs.

4.2 Techniques to Prevent Sample Contamination

Sample contamination can be caused by poor sampling-handling, atmospheric input, poorly cleaned equipment, inadequate training, and the use of equipment not designed for the analytes targeted for the study. Contamination from these sources can be prevented or minimised by using sound field practices including:

- Being aware of and recording potential sources of contamination at each sample site and sample location;
- Wearing appropriate disposable, powderless nitrile gloves, changing them before sample collection, and avoid touching potentially contaminated surfaces / items before sampling;
- Using equipment constructed of relatively inert materials in respect to the analytes being tested for;
- Using correct sample-handling procedures including the minimisation of the number of sample handling steps, and being trained prior to sampling;
- Collecting samples in enclosed chambers where possible to minimise contamination from atmospheric sources;
- Following a prescribed order for collecting samples (that is, going from less contaminated locations (or least likely) to more contaminated locations (or most likely); and
- Minimise usage and contact of extraneous contaminants (eg sun lotion, insect repellents, perfumes, cosmetics, fuels, chemicals etc) with sample bottles.

4.3 Equipment Decontamination

All equipment (with the exception of new, disposable equipment) that is used for the collection of samples has to be decontaminated before and after use. The general decontamination steps include the following:

- Decontaminate equipment away from the sample locations to reduce the potential for cross-contamination;
- If possible, disassemble the equipment to be washed;
- Prior to wash, remove soil adhering to the sampling equipment by scraping, brushing or wiping with disposable towels;
- Use a phosphate-free detergent solution (e.g. Decon 90) to wash the equipment. Bleach may be required to sterilise equipment when sampling for microbiological parameters. A solvent wash (e.g. acetone) may be required when investigation the presence of organic contaminants. A dilute acid wash may be required for inorganic compounds. The requirement for a bleach, solvent or dilute acid wash is determined on a site–specific basis (depending upon analytes of concern and laboratory requirements) and if required should be outlined in the SAQP;
- Wash the equipment by scrubbing with an inert brush;

- After the detergent wash, wash and rinse the equipment with contaminant free tap water and then follow with a rinse of distilled or deionised water;
- Equipment should be air dried before its next use or storage; and
- For quality control purposes, at least one equipment wash blank (rinsate sample) per day of sampling must be taken using deionised water only.

Decontamination of large equipment using the procedure provided above may not be possible. In such cases the equipment should be decontaminated using the following procedure:

- Prior to washing, remove soil and foreign material adhering to augers, drill rod or other large equipment by scraping, brushing or wiping;
- Thoroughly pressure wash equipment with tap water and phosphate-free detergent. Where high pressure washing is not possible, then the sampling equipment should be washed and scrubbed thoroughly with potable water and phosphate free detergent;; and
- If the equipment is still contaminated by grease, tar or similar material, then steam clean.

The Robson field staff should document all decontamination procedures used.

4.4 Sample Containers, Preservation, Storage, Labelling and Shipment

The following containers are used for soil samples:

- Major analytes (including leachability testing) - laboratory supplied 125 m or 250 mL unpreserved glass jars with screw top Teflon lined lids for soil samples;
- Microbiological analysis – laboratory supplied 125 mL plastic container, $Na_2S_2O_3$ washed and sterilised;
- Asbestos fibres in soil – One zip lock plastic bag containing approximately 500 mL of soil sample. This bag should then be placed into another bag (that is, double bagged);
- Potential asbestos containing material (ACM) e.g. fibre board – collect piece of potential ACM and store in zip lock plastic bag. This bag should then be placed into another bag (that is, double bagged); and
- PID Screening of soil – One zip lock plastic bag containing approximately 100 g of soil sample.

Decisions concerning the number and types of sample containers required, preservation methods, labelling, holding times and transportation should be made during the planning phase and outlined in the SAQP and discussed in the briefing prior to the fieldwork.

Open only one sample container immediately before filling. Once filled, immediately place the glass jar in the cooling container on ice. Plastic zip lock bags containing asbestos samples do not require preservation with ice – they do however need to be double bagged as discussed above.

Plastic zip lock bags containing soil samples for PID screening should be stored out of direct sunlight until screening is complete. Specific guidance regarding the screening of samples with the PID is provided in **Section 3.1.1**.

Where possible, sample bottles should be labelled before collecting the sample. If this is not possible, use appropriate care to ensure that samples do not become confused. Use waterproof labels. Labels should include the following information:

- A unique sample identifier;
- Project number;
- Date and time sample collected; and
- Sample collector's initials and name of company (Robson).

Where possible, the nomenclature for the unique sample identifiers should be based upon the feature being sampled and the sample depth. Examples of features and appropriate nomenclature follow:

- Borehole (BH) – example BH1 (0.0-0.3);
- Test Pit (TP) – example TP1 (0.0-0.3);
- Stockpile (SP) – example SP1 (0.2);
- Excavation (EX) – example EX1 (0.5);
- Tank excavation (TE) – example TE1 (3.2);
- Fuel line (FL) – example FL1 (0.2);
- Vent Line (VL) – example VL1 (0.2);
- Bowser (B) – example B1 (0.2);
- Imported Fill (IF) – example IF1 (0.2);
- Backfill (BF) – example BF1 (0.2);
- Duplicate or triplicates for QA/QC purposes – example QC1;
- Rinsate blank (R) – example R1;
- Trip blank (TB) – example TB1;
- Field Blank (FB) – example FB1; and
- Spike sample (Spike) – example Spike1.

Table A on page 18 includes a summary of the recommended sample containers, preservation and holding times for a variety of commonly assessed contaminants and parameters. Remember that collecting insufficient sample may result in higher detection limits, or impact upon the analytical screens which can be performed by the laboratory (e.g. insufficient sample to allow analysis).

Once the jar is filled, immediately place the jar in an ice cooled container (e.g. Esky). A combination of frozen reusable ice blocks and crushed ice (human consumption grade) should be used with the aim of preserving the samples in the esky at a temperature between 1°C and 4°C.

Shipping precautions should include the following:

- Re-check that the lids on the jars are tight and properly sealed;

- To prevent breakage or damage to the samples during transportation, it is advisable to wrap the sample jars in bubble warp before placing them in the cooling container (e.g. esky);
- Make an effort to minimise delays between sample collecting and shipment to the laboratory; and
- To ensure careful handling during transportation, 'Fragile' adhesive taping should be wrapped around the container is clearly visible locations.

Sample tracking, security and chain of custody (COC) procedures provide a legal record of sample transport, possession and handling. Complete a COC record for each sampling event. The following information should be clearly written on each COC sheet:

- Job number and project;
- Page number and number of COC sheets in the batch;
- Sampler's name and project manager contact details;
- Sample identification, date of sampling; sample medium (eg water), container information, number of containers and sample preservation;
- Requested analysis, turn around time and limits of laboratory reporting;
- Name of person relinquishing samples to courier or laboratory; and
- Laboratory address and date delivered to laboratory.

Table A: Summary of Soil Sample Preservation and Holding Times

Parameter	Minimum Sample Volume	Sample Preservation	Holding Time
BTEX, TPH, OCP, OPP, PCB, PAH, Phenol, SVOC, VOC, VHC, TOC	20g	4°C	14 days
Metals	20g	4°C	6 mths, Hg and speciated chromium 28 days
TCLP Analysis	100g	4°C	14 days for organics, 6 mths for metals, 28 days for Hg and speciated chromium
Acid Sulphate Soils	20g	4°C Freeze	24 hrs 7 days
Microbiological	125ml	4°C, Sterile, $Na_2S_2O_3$	24 hrs

Asbestos	30g	Nil	Indefinite

The COC form must accompany the samples submitted to the laboratory to ensure sample traceability. The samples should be transported to the analysing laboratory as soon as possible after collection. Each time the samples change possession, whoever relinquishes and whoever receives the samples must sign, date and time the COC documentation form.

4.5 Sample Jar Filling

Use extra caution when collecting samples that have a medium to high potential to volatilise. Samples for volatile analysis should not be homogenised, combined or composite samples made prior to analysis due to the potential for loss of volatile matter. To prevent loss of volatiles, the soil should be placed in the jar as quickly as possible and filled to the top. Take care to fully fill jars leaving no head-space. Once the jar is filled, immediately screw the cap on tightly. Threads on the jar and lid may need to be cleaned to ensure a tight seal when closed.

4.6 Observation and Recording Information

All daily sampling activities should be recorded on the field sheets, including significant events, sampling locations and numbers, observations, measurements and weather conditions. All entries should be dated and signed.

Field sheets which should be completed during field activities relating to soil sampling include the following:

- Daily Site Activities Sheet;
- Field Observation Form;
- Site sketches;
- Field Screening of Soil / Materials;
- Borehole and/or test pit log;
- Chain of Custody (COC);
- Field QA/QC Register;
- Calibration Register;
- Photographic Log; and
- Survey sheet.

Before sampling complete site information details on the Daily Site Activities Sheet and the Field Observation Form, including the date and time of day. In the comments section note any conditions that may indicate potential for soil contamination to be present (e.g. visual and/or olfactory indicators of contamination, stressed vegetation, location and condition of nearby areas of environmental concern (e.g. tanks, sumps, drains, fill, stockpiles etc), indicators of previous environmental assessments (e.g. boreholes, monitoring wells), ground condition and type of cover.

When recording measurements, write down the unit of measurement immediately the reading is taken. It is best practice to always check the units displayed at the time of measurement and record readings with their unit of measure on the data sheet. The unit of measurement is always displayed on the screen. It is essential for data quality and assurance to record the measurement in the units which the meter is displaying. Some instruments freely switch between units (auto range), so it is good practice to check it each time a reading is recorded. Never convert units in the field. If necessary the units can be later converted in the office at a time when the data is being prepared for a report.

Take photographs of each sample location. Where possible try to show the intersected geology (e.g. test pit wall) or other specific point of interested (e.g. zones of contamination) and include a scale indicator (e.g. shovel).

Check that the field sheets are filled out completely at each sample location prior to moving on to the next sample location.

It is neither required nor advocated that smelling of samples is necessary. That is, do not 'stick your nose' in or over the sample. If odours are noticed however, then make a record of such and where possible indicate pungency and type of odour.

4.7 Protecting the Environment

It is the Robson field staff members responsibility to ensure that all excavations and boreholes etc are left in a safe condition. Failure to do so could results in Robson and the field staff member being held liable for an accident. It is generally the subcontractors responsibility to backfill excavations and unless otherwise instructed, the Robson field staff member should confirm that the excavations are backfilled. Excavations left open should be clearly barricaded. Use barricades at least 1 m high, brightly coloured and with warning signs. If boreholes are to be left open they should be capped or covered or well protected.

Other factors to be implemented to protect the site include:

- Barricade or demarcate the work area to restrict entry;
- Minimise dust generation;
- Put all rubbish generated into a rubbish bin or remove from site and dispose of appropriately;
- Disturb the site as little as possible during sampling operations;
- Label all waste containers (empty solution bottles can be used for this purpose marked with permanent pen as 'Waste');
- Pour all waste from chemical and physical testing into a waste bottle;
- At contaminated sites, treatment and disposal of contaminated soil cuttings require care to avoid risks to occupational health and safety or pollution of surface water, land or uncontaminated groundwater. Drums and containers used for the storage of such waste awaiting disposal should be clearly labelled as contaminated soil with the name and contact details of Robson and the Project Manager; and
- Dispose of the waste material through an accredited / approved waste disposal service.

5 SOIL SAMPLING METHODS

5.1 Surface Grab Samples

Surface soil is generally classified as soil between the ground surface and a depth of 0.2 m below the ground surface. Grab samples (e.g. from the surface or from the walls / base of excavations) can be collected using a trowel, shovel or similar. The general procedure for the collection of surface grab samples is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Label sample jars, bottles and bags;
- Collect the sample and place in appropriate sample container. Also collect a sample and place in a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;
- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly. Place jar in ice cooled esky;
- Lithologically log the sample and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**; and
- Either discard or decontaminate all items which came into contact with the sample before proceeding onto the next sampling location.

5.2 Hand Augering

The general procedure for the collection of soil samples using a hand auger is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;
- Ensure that the sample location is clear of underground utilities, and overhead obstructions, utilities and services etc;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Lay out plastic sheeting adjacent to the sampling location to prevent direct contact with the ground surface;
- Label sample jars, bottles and bags;
- Auger to the desired sampling depth or the auger is full of soil. Remember to proceed cautiously and only hand auger at a force that would not cause damage to services if encountered. Carefully remove the auger from the hole. If the desired depth has not been reached, continuing augering and emptying the auger as needed. Emptied soils should be deposited in the plastic ground sheet to facilitate refilling the hole and to prevent contamination of the surrounding area. Depending upon the borehole depth, additional solid stem flights may need to be attached to the auger;
- Before sampling off the auger stem, remove the outer centimetre or so of the soil to reduce the potential for cross-contamination from fall-in from the upper portions of the hole, or smearing effects when withdrawing the auger from the hole;

- Collect the sample off the auger by collecting in a stainless steel pan or bowl. Once the soil is in the pan it should be mixed thoroughly and then placed in appropriate sample container. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;
- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly and place jar in ice cooled esky;
- Lithologically log the sample and the boring and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**; and
- Either discard or decontaminate all items which came into contact with the sample before drilling and sampling at a deeper depth or before proceeding onto the next sampling location.

5.3 Trenches and Test Pits

The general procedure for the collection of soil samples from trenches or test pits is as follows:

- Where possible, ensure the excavator bucket or backhoe and all equipment to be used for sampling has been decontaminated;
- Ensure that the sample location is clear of underground utilities, and overhead obstructions, utilities and services etc;
- Barricade the work area to restrict entry of unauthorised people. Ensure that trenches and test pits are not left unattended while they are open. Keep equipment and personnel at least 0.6 m away from the excavations edge. Do not enter excavations greater than 1 m in depth;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Lay out plastic sheeting adjacent to the sampling location to prevent direct contact with the ground surface;
- Label sample jars, bottles and bags;
- Excavate to the desired sampling depth or until the bucket/backhoe is full of soil. If the desired depth has not been reached, continuing excavating and emptying the bucket as needed. Emptied soils should be deposited in a stockpile adjacent to the hole to prevent contamination of the surrounding area. In extreme cases, the excavated soil should be placed on plastic sheeting or an impermeable surface, with obviously impacted soil (eg stained or odorous material) being segregated from non-impacted soil. Bunding with hay bales and other sediment controls may also be necessary;
- To reduce the potential for cross contamination, the soil sample should be collected from the middle of the excavator bucket as this soil is less likely to have come into contact with the surface of the bucket itself. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;
- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly and place bottle in ice cooled esky;

- Lithologically log the sample and the trench / test pit and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**;
- Either discard or decontaminate all items which came into contact with the sample before excavating and sampling at a deeper depth or before proceeding onto the next sampling location;
- Depending upon Client requirements, backfill the trench / test pit with the removed soil material and reinstate surface coverings. The backfill material should be compacted with the available plant (e.g. excavator) to reduce site hazards and obstructions.

5.4 Sampling Using Drilling Rigs

The general procedure for the drilling and sampling of bore holes with a drilling rig is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;
- Check that the plant equipment register indicates recent service. Also, check that the persons undertaking the drilling have adequate qualifications, licences and experience;
- Ensure that the sample location is clear of underground utilities, and overhead obstructions, utilities and services etc. Verify the location of overhead structures and services; do not drill within certain distances of services as per state/territory requirements;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Lay out plastic sheeting adjacent to the sampling location to prevent direct contact with the ground surface;
- Label sample jars, bottles and bags;
- Hand auger or use Non-Destructive Drilling (NDD) for the first 1.2 m (or greater depending upon Client requirements), to confirm the absence of underground services;
- Drill to the desired sampling depth or the auger/core barrel/SPT tube is full. Carefully remove the auger/core barrel/SPT tube from the hole. If the desired depth has not been reached, continuing drilling and emptying the auger/core barrel/SPT tube as needed. Emptied soils should be deposited in the plastic ground sheet to facilitate refilling the hole and to prevent contamination of the surrounding area. Cores should be placed in core trays;
- Collect the soil sample from the drilling device. Specific techniques for sampling from the different drilling methods are discussed below in **Sections 5.4.1 to 5.4.4**. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;
- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly and place bottle in ice cooled esky;
- Lithologically log the sample and the boring and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**; and

- Either discard or decontaminate all items which came into contact with the sample before drilling and sampling at a deeper depth or before proceeding onto the next sampling location; and
- Ensure that the drilling mast is lowered before moving to new sample locations.

5.4.1 Auger Drilling

Issues specific to collection of soil samples when auger drilling include the following:

- Before sampling off the auger stem, remove the outer centimetre or so of the soil to reduce the potential for cross-contamination from fall-in from the upper portions of the hole, or smearing effects when withdrawing the auger from the hole; and
- Collect the sample off the auger by collecting in a stainless steel pan and then placed in appropriate sample container. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening.

5.4.2 Hammer Drilling

Soil cuttings brought to the surface during hammer drilling can be collected for future reference and/or laboratory analysis, however undertaking chemical analysis of such samples is not normally recommended for the following reasons:

- Loss of volatile compounds. The drilling process requires the injection of compressed air, plus can generate high temperatures at the drill bit, both of which can cause volatilisation of volatile compounds. As a result, analytical results may not be representative of in-situ contaminant concentrations;
- Possibility of cross contamination. Relatively uncontaminated material from depth may come into contact with shallow contaminated material when being brought to the surface;
- The sampling interval is not accurately known as there is a time lag between the cutting of soil at the drill bit face and when the sample is ejected to the surface; and
- Hammer drilling through dry soil and rocks may result in significant dust generation, which could result in an unsafe work environment, contaminant dispersal etc. Dust mitigation measures should therefore be implemented including the use of cyclones, wet hessian sacks covering the outlet pipe, or similar.

5.4.3 Core Drilling

Issues specific to collection of soil samples when core drilling include the following:

- Core barrels typically range in length from 0.5 m to 3.0 m. The core barrel is recovered after each interval is drilled;
- Representative sub-samples of the soil core can be transferred to appropriate sample containers for laboratory analysis or the entire length of core can be placed in core trays should it be necessary to retain them. If placing in core trays, then the core should be placed ‘deep’ end down in the core tray and the core tray labelled with hole number, depth interval, missing sections due to lack of core recovery etc. In addition, should

portions of the core be removed for analysis, then blocks indicating the length and depth interval of the portion removed should be appropriately located within the core tray;

- If it is possible that future sampling of stored core for laboratory analysis may be required, then the core tray should be made of or lined with an inert material to reduce the potential for cross contamination; and
- Core barrels are commonly rusty and have been used on numerous occasions for the collection of contaminated soil samples. As the core sample comes into direct contact with the core barrel it is therefore imperative that the core barrel components are decontaminated prior to use, and between each sample.

5.4.4 SPT and Push Tube Sampling

Issues specific to collection of soil samples when SPT (standard penetration test) drilling or push tube sampling include the following:

- SPT splits are commonly rusty and have been used on numerous occasions for the collection of contaminated soil samples. As the soil samples come into direct contact with the splits it is therefore imperative that the splits and sample catcher are decontaminated prior to use, and between each sample;
- Allow the driller to remove the SPT tube from the borehole and open the split spoon. If using PVC tubes for sample collection, the driller when then cut open the tubes;
- Collect representative soil sample directly from the splits or the PVC tube;
- In some situations where the soils are loose and/or granular, it may not be possible to recover a sample from the splits or tube. In such situations, an idea of the composition of the penetrated soils can be obtained by close inspection of the inside of the splits as a small amount of soil tends to stick onto the split/tube surface; and
- Duplicate samples can be collected from the recovered soil sample by slicing segments of the recovered core into longitudinal sections over the one sampling interval, and transferring the soil from each side to separate containers.

6 LOGGING OF SOIL

Soils should be logged based on visual inspection of the soil sample, soil cuttings and/or exposed in the base and walls of an excavation. In addition, when drilling the environmental scientist should liaise with the drilling to obtain as much possible information as possible regarding the drillers interpretation of the subsurface conditions encountered.

The aim of effective and accurate logging is to ensure that:

- All observable and significant properties of a soil are described and noted;
- Consistent terms and meanings are used to described soils; and
- The properties of the soil are described in the same relative order.

Logging the physical properties of soils should be undertaken using the Unified Soil Classification System (USCS). Soil should be described in the following order:

- USCS classification symbol and ground name, which is based on grain size and physical properties (e.g. clays, silts). Where several components are present, the major component forms the root name and the minor component is used as the modifying adjective (e.g. sandy CLAY – the major constituent is clay and the minor constituent is sand). Recommended USCS classifications are provided in **Table B**;
- Colour. The colour of the soil is described in the moist condition using the colours of the Maunsell Colour Chart. These may be modified by adjective such as 'light' or 'dark'. Borderline colours can be described as a combination of colours. Additional information regarding colour is provided in **Table C**;
- Particle size range or plasticity. Use the descriptors provided in **Table D** based upon particle size;
- Consistency. Indicate whether the soil is cohesive or not;
- Moisture content. Indicate whether the soil is dry, moist or wet;
- Structure. The soil may consist of separate zones differing in colour, grain size or other properties. The patterns of such zones should be described using the following terms:
    - 'Layer' – zone is continuous across the exposure or sample;
    - 'Lens' – a discontinuous layer of different material, with a lenticular shape;
    - 'Pocket' – an irregular inclusion of different material;
- Additional comments indicating soil characteristics such as odours (see **Tables E and F**), evidence of soil contamination, water seepage (both in and out). The abundance of inclusions can also be described based upon criteria outlined in **Table G**; and
- Interpretation of geologic origin (e.g. residual, alluvium, fill material).

With regard to depths, it is important to record the upper and lower limits (in metres) of the various layers, soil horizons and types of fill materials encountered. With regards to odours, it is neither required or advocated that smelling of samples is necessary. That is, do not 'stick your nose' in or over the sample. If odours are noticed however, then make a record of such and where possible indicate pungency and type of odour. Suggested odour descriptions and odour strength are provided below in **Tables E** and **F** respectively.

Table B: Unified Soil Classification System

Major Divisions			Group Symbol	Typical Group Name
Coarse Grained Soils (More than half of material is individual grains visible to the naked eye)	Gravelly Soil (more than half of coarse fraction is larger than 2.36 mm)	Clean Gravel (will not leave a stain on wet palm)	GW	Well graded gravel, fine to coarse gravel
			GP	Poorly graded gravel, predominantly one size or range of sizes with some intermediate sizes missing
		Dirty Gravels (will leave a stain on wet palm)	GM	Silty gravel
			GC	Clayey gravel
	Sandy Soils (more than half of coarse fraction is smaller than 2.36 mm)	Clean Sands (will not leave a stain on wet palm)	SW	Well graded sand, fine to coarse sand
			SP	Poorly graded sand, fine to coarse sand
		Dirty Sand (will leave a stain on wet palm)	SM	Silty sand
			SC	Clayey sand
Fine Grained Soils (More than half of material is individual grains not visible to the naked eye)	Silt and Clay (Liquid limit less than 50)	Inorganic	ML	Silt
			CL	Clay of low to medium plasticity
		Organic	OL	Organic silt or organic clay of low plasticity
	Silt and Clay (Liquid limit greater than 50)	Inorganic	MH	Silt of high plasticity
			CH	Clay of high plasticity
		Organic	OH	Organic clays of medium to high plasticity
Highly Organic Soils			Pt	Peat, muck and other highly organic soils

Table C: Soil Colours

Soil Colour	Potential History or Behaviour
Red	Well drained
Yellow or grey	Poorly drained
Dark soils	Higher levels of organic matter
Bluish or greenish grey (grey colours)	Water logged soils

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

Table D: Particle Size or Plasticity

Term		Grain Size / Description
Boulders		Greater than 200 mm
Cobbles		50 mm to 200 mm
Gravels	Coarse	20 mm to 50 mm
	Medium	6 mm to 20 mm
	Fine	2.36 mm to 6 mm
Sands	Coarse	0.6 mm to 2.36 mm
	Medium	0.2 mm to 0.6 mm
	Fine	0.075 mm to 0.2 mm
Non plastic		A 3 mm thread cannot be rolled at any water content
Low Plasticity		A thread can be barely rolled
Medium Plasticity		A thread is easy to roll
High Plasticity		A thread is easy to roll and can be rerolled several times

Table E: Odour Descriptions

Odour Description	Contaminant Indicated
Characteristic sharp, pungent	Ammonia
Petroleum products	Petrol, diesel, oil
Compost	Decayed organic matter
Putrefied	Putrescible waste
Rotten egg smell (sulphurous)	Anaerobic or acid sulphate conditions
Acidic	Mineral or organic acid
Caustic	Caustic material
Septic	Decaying organic matter, sewage
Sweet, solvent type	Ketone
Aromatic	Benzene

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

Table F: Description of Odour Strength

Strength	Decsription
Weak	Just detectable; location difficult to determine
Distinct	Detectable immediately adjacent to source, bearable at source
Strong	Detectable 20 m from source, bearable at source
Very Strong	Detectable at distances greater than 20 m from source, pungent at source

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

Table G: Abundance Classes

Description	Visual Estimate (%)
Very few	Less than 2%
Few	2% to 10%
Common	10% to 20%
Many	20% to 50%
Abundant	50% to 90%
Profuse	Greater than 90%

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

7 FIELD QUALITY ASSURANCE / QUALITY CONTROL

A primary task of any environmental assessment is the implementation of a quality assurance / quality control (QA/QC) program to ensure that the field work program and analytical results obtained are of the highest quality. The requirements of the field QA/QC program should be determined prior to initiating the sampling works using the Data Quality Objective (DQO) process, and then outlines in the SAQP and discussed in the briefing prior to the fieldwork.

On short duration projects (e.g. one round of sampling), the review of the QA/QC process is often undertaken once the analytical results are available. In such cases, review of the QA/QC data is undertaken to assess the integrity of the data. On large projects extending over periods of months or years involving numerous rounds of sampling and or different phases of assessment works, the results of the QA/QC program should be monitored on a continual basis to ensure the integrity of the collected data, and/or to determine the necessity for corrective actions (if required).

7.1 Quality Assurance

Quality Assurance (QA) refers to the procedures to be implemented during the field work. The QA procedures for soil sampling are documented in this SOP. All personnel undertaking soil sampling should be familiar with the contents of this SOP and should carry it in the field with them at all times.

7.2 Quality Control

In essence, the purpose of quality control (QC) samples is to determine the accuracy and precision of the field sampling, transportation and laboratory analysis, and thereby assess whether the results are representative of the waters sampled. All QA/QC samples must be collected, handled and processed in the same exact manner as the other samples being collected.

7.2.2 Field Duplicate Samples

Duplicates are two independent samples which are collected as close as possible to the same point in space and time and are subjected to the same filtering, preservation, holding and analysis methods. These samples are stored in separate containers and analysed independently. Duplicates are used to assess the precision of the field sampling techniques and analytical processes. In addition, a triplicate is a version of a duplicate sample but is sent to a secondary laboratory to confirm the accuracy of the results of the primary laboratory.

Field duplicates and triplicates should be sampled at a rate of one duplicate per 10 primary samples (or parts thereof). If submitted to the primary laboratory, the field duplicate should be labelled with a unique identifier with no reference whatsoever to the corresponding primary sample of the duplicate pair. The field duplicate should be analysed for the same parameters and analytes as the corresponding primary sample of the duplicate pair.

Where possible, duplicate samples should be collected from samples that are known or suspected to be contaminated or contain detectable concentrations of contaminants of concern. In addition, where possible duplicate samples should be collected from over a range of contaminant concentrations so as to enable assessment over the low, middle and high range of contaminant concentrations.

For non-volatiles, the sample is to be homogenised in the field to help ensure a representative sample is place in each of the primary / duplicate / triplicate jars. For volatile and semi-volatile analytes, no mixing shall be undertaken in the filed. Instead, representative duplicates / triplicates shall be prepared by adding incremental portions of the original sample into each jar.

The requirements of the duplicate sampling should be kept in mind during the project to ensure that suitable duplicate samples and a sufficient number of duplicate samples are collected.

7.2.3 Blank Samples

A blank is a sample comprised of deionised water that is carried through all or part of the sampling process. Blanks include the following:

- Trip blanks which are used to monitor potential contamination during transport and storage. They are sent from the laboratory with empty containers and remain unopened with the other samples throughout sampling and transport. As a minimum, one trip blank per day of sampling (or part thereof) should be taken; and
- Rinsate blanks which are used to monitor potential cross-contamination between sample locations and for potential influences from sampling equipment. The rinsate blank is taken from the final rinse of equipment after decontamination. The rinsate blanks should be analysed for the same analytes as the samples. As a minimum, one rinsate blank per day (or part thereof) should be taken.

8 REFERENCES

Australian Standard AS1726-1993 '*Geotechnical Site Investigations*'.

Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-volatile and semi-volatile compounds*'.

Australian Standard AS4482.2-1999 '*Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 2: Volatile Substances*'.

EPA Victoria (2009) '*Sampling and Analysis of Waters, Wastewaters, Soils and Wastes*' (EPA Victoria, Industrial Waste Resource Guidelines (IWRG) 701, June 2009).

Industrial Solutions (2009) '*MX6 iBrid Multi-Gas Monitor Operation Guide*'.

RAE Systems (2005) '*MiniRae 2000 Portable VOC Monitor. Operation and Maintenance Manual*'.

9 ABBREVIATIONS

ACM	Asbestos Containing Material
AS	Australian Standard
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
$C_6 – C_9$	Total Petroleum Hydrocarbon fractions
COC	Chain Of Custody
DQO	Data Quality Objectives
eV	Electron Volts
MSDS	Material Safety Data Sheet
NDD	Non-Destructive Drilling
OCP	Organochlorine Pesticide
OPP	Organophosphate Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Photoionisation Detector
PPE	Personal Protective Equipment
ppm	Parts Per Million
SAQP	Sampling and Analysis Quality Plan
SOP	Standard Operating Procedure
SPT	Standard Penetration Test
SSMP	Site Safety Management Plan
SVOC	Semi Volatile Organic Compounds
TPH	Total Petroleum Hydrocarbon
QA	Quality Assurance
QC	Quality Control
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
USCS	Unified Soil Classification System
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds

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1 INTRODUCTION

1.1 Purpose

The purpose of this Standard Operating Procedure (SOP) is to document the standard protocols for Robson environmental scientists, engineers and technicians for the assessment of asbestos-contaminated soil stockpiles. The SOP methodologies are sourced from the ACT EPA endorsed guideline:

- Western Australia Department of Health (DOH) (2009) '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*'.

It is considered that following the recommended protocols will provide a method for determining the asbestos concentration in a soil stockpile via:

- Ensuring that the samples are representative of the soil medium from where they are collected;
- Preserving the representative nature of the sample until analytical determinations and/or measurements are made;
- Providing representative samples to facilitate observation and logging of the subsurface conditions; and
- Providing accurate and consistent determination of the physical presence of asbestos in the soil sampled.

1.2 Scope

The scope of this SOP is the collection and handling of soil samples for field and/or laboratory analysis, to facilitate the assessment of asbestos-contaminated soil stockpiles. The procedures apply to the preparation and fieldwork for baseline assessments and contaminated site assessments. The SOP is applicable to the Project Manager designing and supervising the sampling program, and for environmental scientists, engineers and technicians implementing the sampling program in the field.

1.3 Nature of Asbestos Contamination

For the purpose of this SOP, the nature of asbestos contamination is divided into three (3) groups:

- Asbestos Containing Material (ACM) – Products or materials that contain asbestos in an inert bound matrix such as cement or resin (e.g. asbestos sheeting or vinyl tiles). Taken to be sound material though possibly as broken or fragmented pieces will not fit through a 7 mm by 7 mm sieve. Can often be detected visually;
- Fibrous asbestos (FA) – Encompasses friable asbestos material (e.g. severely weathered ACM), or asbestos in the form of loose fibrous material such as insulation products. Further defined as ACM that is in a degraded form that can be broken or crumbled by hand pressure. Can often be detected visually; and
- Asbestos Fines (AF) – Free fibres of asbestos, small fibre bundles and also ACM fragments that can pass through a 7 mm by 7 mm sieve.

Both FA and AF have the potential to generate or be associated with free asbestos fibres, which can cause considerable inhalation risk if made airborne.

2 PREPARATION AND EQUIPMENT

2.1 Preparation

- Review Sampling and Analysis Quality Plan (SAQP). If a SAQP is required then this should have been prepared by the Project Manager prior to the sampling event;
- Contact the laboratory to confirm that they are able to undertake required analysis, that they have capacity to undertake the analysis within the required timeframe, and to establish any specific sample size / preservation requirements;
- Organise site information including the following:
  - Site access including permissions, directions to the site and site access roads, site access keys,
  - Contact names, addresses and phone numbers;
  - Site map showing sampling locations;
- Organise and check equipment. This includes the following:
  - Test and recharge/replace batteries for the weighing scales the s necessary;
  - Check the instruments' ability to function properly;
  - Inspect the equipment for defects, loose or frayed wires and that cables are in good condition etc;
  - Check that all equipment is properly stored for transport;
- Organise sampling equipment. This could include the following items:
  - Field sheets, writing equipment, waterproof markers,
  - Calculator, camera and telephone;
  - Weighing scales;
  - $\leq$ 7 mm sieve and 10 L bucket;
  - Measuring wheel;
  - Plastic sheet or ground cover;
  - Air monitoring equipment including pumps, cowls, flow meter and tubing, jeweller's screwdriver, and air monitoring site sheets;
  - Decontamination equipment include non-phosphate cleaner (e.g. Decon 90), scrubbing brushes, wash and rinse buckets, wastewater containers, deionised / demineralised water and potable tap water;
  - Sample collection devices such as trowels, hand augers, stainless steel mixing bowls, paper towelling, zip lock plastic bags and bulk sample bags;
  - Sample bags to dispatch samples to laboratories for asbestos analysis (plus extras for replacements if needed), packing box and 'Fragile' adhesive tape;
  - Tools including wrench, screw driver, pliers, knife, duct tape and hammer; and
  - Personal Protective equipment including disposable gloves, leather gloves, safety glasses, filter marks (and that cartridges are within use by date), disposable tyvek coveralls, hard hat, steel cap boots, rubber boots with steel caps, high visibility clothing, first aid kit; ear muffs / plugs;

- Antiseptic handwash;
- Suitable bags for disposal of generated wastes; and
- Material safety data sheets (MSDS) for all chemicals brought onto site.

2.2 Preparatory Work on Site

- Obtain all necessary permits required prior to intrusive works (eg hot works permits, AIP Work Clearance for Contractors form);
- Where necessary, contact the Client or site contact to confirm arrangements, identify specific site issues and / or undertake site inductions;
- Induct all Robson personnel and sub-contractors onto the site using the pre-prepared and site specific Site Safety Management Plan (SSMP);
- Set up air monitoring pumps (guidance regarding this is provided in **Section X**);
- Assess the volume of the soil stockpile. This facilitates determination of the number of sampling locations required, based on a minimum sampling rate of 1 location per 70 m^3 or part thereof; and
- Visually assess the surface of the stockpile for ACM. If present, then such areas should be focussed as a sampling location for bulk sample sieve analysis. Locations are generally identified using either a GPS or by measurement from an obvious reference point using a measuring wheel or tape measure. In specified circumstances, locations may need to be identified using a registered surveyor – if this is required then the Project Manager should have already made appropriate arrangements. Record the observations, locations and rationale for selection of locations.

2.3 Use of Weighing Scales

2.3.1 D.Line 5 kg Weighing Scale

- Press **ON/TARE** button. Allow approximately 2 seconds for unit start up. Confirm that the unit is reading in metric gram (g) units. If the unit is reading in imperial ounces (oz) press the **kg/lb** button and then confirm that the unit is reading in metric g units;
- If it is required to find a tare weight and zero the scales (eg to take into account the weight of a sample bag or similar holding vessel), then whilst the empty sample bag or similar holding vessel is on the scale quickly press the **ON/TARE** button and the LCD screen should then read 0 g; and
- The unit will automatically turn itself off after approximately 1 minute without use. If it is required to turn the unit off manually, then press the **ON/TARE** button for approximately 2 seconds until the LCD display is blank.

2.3.2 ACS-3S 30 kg Weighing Scale

The ACS-3S scale has the following basic data:

- Maximum capacity of 30 kg;
- A resolution of either 2 g, 5 g or 10 g; and
- A working temperature of -5°C to 35°C.

To operate the scale:

- Make the pan of the scale horizontal be adjusting the base foot and watching the spirit level;
- To turn the scale on, press the **ON/ZERO** button. The unit will then go through a start up process and the 'ZERO' lamp will light up. The unit is now working;
- If it is required to find a tare weight and zero the scales prior to weighing an object (eg to take into account the weight of a sample bag or similar holding vessel), then whilst the empty sample bag or similar holding vessel is on the scale press the **TARE** button and the LCD screen should then read 0 g/kg, and the TARE lamp should come on. If the sample bag or similar holding vessel is then removed at this time then the unit will read a negative weight. Pressing the **TARE** button again will now zero the scale;
- To zero the unit at any time press the **ZERO** button. The ZERO lamp will now light up. The ZERO lamp will turn off when a weight is put on the scale;
- To weigh an item (with or without Tare), place the object on the scale, the ZERO lamp will turn off, and the weight of the object is shown on the LCD display. The lamp for the applicable unit (g or kg) will also turn on;
- If the applied weight is greater than the capacity of the scale (that is, greater than 30 kg) then an audible buzzer will sound and the LCD display will show '-----'. Note that overloading can damage the scale;
- To change the units (e.g. from kg to g, or vice versa), press the SET (0-9) button for 3 seconds. The LCD display will read 'rAngE'. Press the SET (0-9) button again and the LCD display should read 'UnItS'. Now press the TARE button, and the LCD display should read H9 – select H9 (if kg units are required) by pressing the TARE button, otherwise press the SET (0-9) button again. The LCD display should now read 9 – select 9 (if g units are required) by pressing the TARE button. Once the appropriate unit has been selected, confirm this by checking that the appropriate kg or g lamp is turned on;
- To change the increments of measure (e.g. from 2g to 5g or 10g, or vice versa), press the SET (0-9) button for 3 seconds. The LCD display will read 'rAngE'. Press the SET (0-9) button six (6) times so that the LCD display reads 'd'. Now press the TARE button, and the LCD display should read either 2, 5 or 10 (depending upon current selection). Press the SET (0-9) button until the desired increment is showing on the LCD display, and press the TARE button to select. Once the appropriate increment has been selected, confirm this by weighing an object; and
- The unit will automatically turn itself off after approximately 10 minute without use. If it is required to turn the unit off manually, then press the **OFF** button for approximately 1 second until the LCD display is blank.

2.4 Use of Air Monitoring Pumps

- Select the number of pumps required from the Robson store – only select those labelled '3' or greater;
- Complete the following details on the Air Monitoring Site Sheet – Job location, pump number (a sheet is required for each pump), cowl number, date, air pump sample location, brief description of work in progress, removal contractor, flow meter number and air sampler initials. In addition, fill in the Ref No. field with the project job number

(e.g. 530201), and the SLIDE No. field with the project job number and the sequential number of the cowl for that project (e.g. 530201-176 if this is the 176th cowl used for air monitoring during the project);

- Attach one end of the long clear flexible plastic tube onto the inlet valve of the air monitoring pump. Then attach the other end of the flexible plastic tube to the outlet valve of the cowl. Remove the cowl inlet cap and store in a safe location as it needs to be refitted to the cowl at the end of the air monitoring session;
- Calibrate the flow of the air monitoring pump.
    - Attach the inlet cowl cap of the flow meter unit (itself attached to the flow meter via a short piece of clear flexible plastic tube) onto the cowl body (which itself is attached to one end of the long clear flexible plastic tube);
    - To turn the pump on, use the jeweller's screwdriver to slide the recessed on/off switch up into the on position. The pump should now make an audible pumping sound;
    - Test the seal of the hoses by very briefly sealing the inlet with the palm of a hand. The pump speed should noticeably increase as well as feeling a suction effect on the palm;
    - Use the jeweller's screwdriver to adjust the pumping rate of the air monitoring pump. Turning the adjustment screw clockwise increase the pumping rate, whilst turn the adjusting screw ant-clockwise reduces the pumping rate;
    - Use the position of the lower bead in the flow meter to set the air monitoring pump to the desired pumping rate. As a guide, the pumping rate is normally set between 1000 millilitres per minute (mL/min) to 2000 mL/min, with the lower rate being used for dustier sites. Fill in the IFR field of the Air Monitoring Site Sheet with the pumping rate, and fill in the ON field with the time that the pump was turned on (use 24 hour time convention);
    - Once the air monitoring pump is set at the required flow rate, remove the inlet cowl cap (attached to the flow meter) from the cowl body. The air pump is now ready for use;
- At the air monitoring location, place the cowling in position either on a stand or tape the hose to a convenient fixture ensuring that the cowl is pointed down and at a height of approximately 1.6 m above ground level. Place the pump in a plastic bag for protection if it looks like it may rain. At least four (4) air monitoring pumps should be used, with one (1) being placed on each boundary of the work area;
- The pump(s) should run for a minimum of 1 hour but preferably for the entire working shift;
- At the end of the monitoring period the flow rate of the pump(s) must be checked. Re-attach the inlet cowl cap of the flow meter unit to the cowl body attached to one end of the long clear flexible plastic tube, and then measure the flow rate using the lower bead of the flow meter. This flow rate is then recorded in the FFR field of the Air Monitoring Site Sheet. If the IFR and FFR flow rate readings are within 10%, then tick the OK field, otherwise tick the REJECT field. Also record the time that the air monitoring pump is turned off in the OFF field;
- To turn the pump off, use the jeweller's screwdriver to slide the recessed on/off switch down into the off position; and

- Attach the cowl inlet cap (which had been stored in a safe location) back onto the cowl body, and then remove the cowl unit from the long clear flexible plastic tube. The cowl unit and the Air Monitoring Site Sheet for each air monitoring pump location should then be passed onto the Robson Laboratory Services for processing. Note that the cowling should not be subjected to rough handling as fibre loss from the filter may otherwise occur.

Note that for quality assurance / quality control (QA/QC) purposes, a blank cowl should be used each day that air monitoring is being conducted. The blank cowl is not attached to any pump but should sit with its' inlet cap removed in the car or samplers field bag to monitor ambient conditions. And the end of the monitoring session replace the inlet cap and then the blank cowl (and its' associated Air Monitoring Site Sheet) should be passed onto the Robson Laboratory Services for processing along with the primary air monitoring sample cowls.

3 ASSESSMENT AND REMEDIATION CRITERIA

3.1 Soil Assessment and Remediation Criteria

Assessment and remediation criteria are defined as threshold levels of asbestos in the soil acceptable for a designated site use and are sourced from the ACT EPA endorsed guideline:

- Western Australia Department of Health (DOH) (2009) '*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*'.

The adopted criteria are summarised below in Table 1.

Table 1: Assessment and Remediation Criteria for Asbestos in Soil

Land Use	Criteria
All site uses	0.001% w/w asbestos for FA and AF
Residential use, day care centres, pre-schools etc (that is, HIL A land use scenarios)	0.01% w/w asbestos for ACM
Residential use, minimal access to soil (that is, HIL D land use scenarios)	0.04% w/w asbestos for ACM
Parks, recreational open spaces, playing fields, secondary schools etc (that is, HIL E land use scenarios)	0.02% w/w asbestos for ACM
Commercial / Industrial (that is, HIL F land use scenarios)	0.05% w/w asbestos for ACM

Notes to Table 1:
ACM – Asbestos Containing Material
FA – Fibrous Asbestos
AF – Asbestos Fines
HIL – Health-Based Investigation Levels. Land use scenarios sourced from National Environment Protection Council (NEPC, 1999) '*National Environment Protection (Assessment of Site Contamination) Measure 1999*'.
w/w – weight/weight, by weight.

In addition to the above, during remediation of any asbestos contamination the top 0.1 m of soil should also be made completely free of visible asbestos.

3.2 Air Quality Criteria

The asbestos air-quality limit for contaminated sites is 0.01 fibre per millimetre (f/ml) using the membrane filter methods, as endorsed by the Health Council (2005) guideline '*Management of Asbestos in the Non-Occupational Environment*'.

Nuisance dust monitoring may also be necessary and can be used to complement asbestos air-quality sampling, especially since it allows for more immediate responses to dust management measures. For nuisance dust, the 24 hour guidance goal of 50 µg/m^3 for PM10 (particulate matter with an equivalent aerodynamic diameter of 10 µm or less - sourced from the NEPC (2003) '*National Environment Protection (Ambient Air Quality) Measure*') should be used.

4 TYPES OF SOIL SAMPLES AND SAMPLE COLLECTION

4.1 Soil Sample Types

Soil samples are commonly obtained from one or more of the following:

- Surface sampling;
- Test pits; and/or
- Boreholes.

From the various sampling methods, two main types of soil samples are collected:

- Disturbed samples – these are samples where the soil has been disturbed loosing its' natural soil structure, physical properties and/or moisture. Disturbed samples are generally collected from grab sampling methods such as during auger or hammer drilling, when sampling from test pits or from the walls/base of excavations or from stockpiles;
- Undisturbed samples – these are samples where the sampled soil remains more-or-less in its' undisturbed state, retaining its' natural soil structure, physical properties and/or moisture. Undisturbed samples can be collected by push tube sampling methods or during core drilling.

A number of different excavation and boring methods are available, however the choice of method requires consideration of the following:

- Objective of assessment and depth of assessment works;
- Site access, ground conditions and acceptable site disturbance;
- Nature of potential contaminants and sample volume required; and
- Type of sample required (e.g. disturbed or undisturbed).

In addition to the above, samples can either be discrete samples or composite samples. Discrete samples are samples collected over a discrete sampling interval which are representative of that interval, but based on observations may also be representative of the surrounding soils. Composite samples comprise a sample which is made up of several sub-samples from a range of locations, material types or depth intervals. Though compositing does have benefits in certain situations (e.g. potential lower screening costs of larger areas), as a general rule Robson does not recommend the collection of composite samples for the following reasons:

- The composite sample is representative only of the composite sample. That is, actual contaminant concentrations may be higher than laboratory results in some sub-samples and lower in other sub-samples;
- The physical mixing process to form the composite sample may inadvertently release some of the volatile contaminants (if present); and
- If a contaminant concentration exceeds the adjusted assessment criteria (that is, the adjusted criteria is the soil criteria divided by the number of samples comprising the composite), then each of the discrete samples making up the composite should be analysed. This prolongs the duration of the assessment and increases the analytical costs.

4.2 Techniques to Prevent Sample Contamination

Sample contamination can be caused by poor sampling-handling, atmospheric input, poorly cleaned equipment, inadequate training, and the use of equipment not designed for the analytes targeted for the study. Contamination from these sources can be prevented or minimised by using sound field practices including:

- Being aware of and recording potential sources of contamination at each sample site and sample location;
- Wearing appropriate disposable, powderless nitrile gloves, changing them before sample collection, and avoid touching potentially contaminated surfaces / items before sampling;
- Using equipment constructed of relatively inert materials in respect to the analytes being tested for;
- Using correct sample-handling procedures including the minimisation of the number of sample handling steps, and being trained prior to sampling;
- Collecting samples in enclosed chambers where possible to minimise contamination from atmospheric sources;
- Following a prescribed order for collecting samples (that is, going from less contaminated locations (or least likely) to more contaminated locations (or most likely); and
- Minimise usage and contact of extraneous contaminants (e.g. sun lotion, insect repellents, perfumes, cosmetics, fuels, chemicals etc) with sample bottles.

4.3 Equipment Decontamination

All equipment (with the exception of new, disposable equipment) that is used for the collection of samples has to be decontaminated before and after use. The general decontamination steps include the following:

- Decontaminate equipment away from the sample locations to reduce the potential for cross-contamination;
- If possible, disassemble the equipment to be washed;
- Prior to wash, remove soil adhering to the sampling equipment by scraping, brushing or wiping with disposable towels;
- Use a phosphate-free detergent solution (eg Decon 90) to wash the equipment. Bleach may be required to sterilise equipment when sampling for microbiological parameters. A solvent wash (e.g. acetone) may be required when investigation the presence of organic contaminants. A dilute acid wash may be required for inorganic compounds. The requirement for a bleach, solvent or dilute acid wash is determined on a site–specific basis (depending upon analytes of concern and laboratory requirements) and if required should be outlined in the SAQP;
- Wash the equipment by scrubbing with an inert brush;
- After the detergent wash, wash and rinse the equipment with contaminant free tap water and then follow with a rinse of distilled or deionised water;
- Equipment should be air dried before its next use or storage; and

- For quality control purposes, at least one equipment wash blank (rinsate sample) per day of sampling must be taken using deionised water only.

Decontamination of large equipment using the procedure provided above may not be possible. In such cases the equipment should be decontaminated using the following procedure:

- Prior to washing, remove soil and foreign material adhering to augers, drill rod or other large equipment by scraping, brushing or wiping;
- Thoroughly pressure wash equipment with tap water and phosphate-free detergent. Where high pressure washing is not possible, then the sampling equipment should be washed and scrubbed thoroughly with potable water and phosphate free detergent;; and
- If the equipment is still contaminated by grease, tar or similar material, then steam clean.

The Robson field staff should document all decontamination procedures used.

4.4 Sample Containers, Preservation, Storage, Labelling and Shipment

The following containers are used for soil samples:

- Major analytes (including leachability testing) - laboratory supplied 125 m or 250 mL unpreserved glass jars with screw top Teflon lined lids for soil samples;
- Microbiological analysis – laboratory supplied 125 mL plastic container, $Na_2S_2O_3$ washed and sterilised;
- Asbestos fibres in soil – One zip lock plastic bag containing approximately 500 ml of soil sample. This bag should then be placed into another bag (that is, double bagged);
- Potential asbestos containing material (ACM) e.g. fibre board – collect piece of potential ACM and store in zip lock plastic bag. This bag should then be placed into another bag (that is, double bagged); and
- PID Screening of soil – One zip lock plastic bag containing approximately 100 g of soil sample.

Decisions concerning the number and types of sample containers required, preservation methods, labelling, holding times and transportation should be made during the planning phase and outlined in the SAQP and discussed in the briefing prior to the fieldwork.

Open only one sample container immediately before filling. Once filled, immediately place the glass jar in the cooling container on ice. Plastic zip lock bags containing asbestos samples do not require preservation with ice – they do however need to be double bagged as discussed above.

Plastic zip lock bags containing soil samples for PID screening should be stored out of direct sunlight until screening is complete. Specific guidance regarding the screening of samples with the PID is provided in **Section 3.1.1**.

Where possible, sample bottles should be labelled before collecting the sample. If this is not possible, use appropriate care to ensure that samples do not become confused. Use waterproof labels. Labels should include the following information:

- A unique sample identifier;

- Project number;
- Date and time sample collected; and
- Sample collector's initials and name of company (Robson).

Where possible, the nomenclature for the unique sample identifiers should be based upon the feature being sampled and the sample depth. Examples of features and appropriate nomenclature follow:

- Borehole (BH) – example BH1 (0.0-0.3);
- Test Pit (TP) – example TP1 (0.0-0.3);
- Stockpile (SP) – example SP1 (0.2);
- Excavation (EX) – example EX1 (0.5);
- Tank excavation (TE) – example TE1 (3.2);
- Fuel line (FL) – example FL1 (0.2);
- Vent Line (VL) – example VL1 (0.2);
- Bowser (B) – example B1 (0.2);
- Imported Fill (IF) – example IF1 (0.2);
- Backfill (BF) – example BF1 (0.2);
- Duplicate or triplicates for QA/QC purposes – example QC1;
- Rinsate blank (R) – example R1;
- Trip blank (TB) – example TB1;
- Field Blank (FB) – example FB1; and
- Spike sample (Spike) – example Spike1.

Table A on page 18 includes a summary of the recommended sample containers, preservation and holding times for a variety of commonly assessed contaminants and parameters. Remember that collecting insufficient sample may result in higher detection limits, or impact upon the analytical screens which can be performed by the laboratory (e.g .insufficient sample to allow analysis).

Once the jar is filled, immediately place the jar in an ice cooled container (e.g. Esky). A combination of frozen reusable ice blocks and crushed ice (human consumption grade) should be used with the aim of preserving the samples in the esky at a temperature between 1°C and 4°C.

Shipping precautions should include the following:

- Re-check that the lids on the jars are tight and properly sealed;
- To prevent breakage or damage to the samples during transportation, it is advisable to wrap the sample jars in bubble warp before placing them in the cooling container (e.g .esky);
- Make an effort to minimise delays between sample collecting and shipment to the laboratory; and

- To ensure careful handling during transportation, 'Fragile' adhesive taping should be wrapped around the container is clearly visible locations.

Sample tracking, security and chain of custody (COC) procedures provide a legal record of sample transport, possession and handling. Complete a COC record for each sampling event. The following information should be clearly written on each COC sheet:

- Job number and project;
- Page number and number of COC sheets in the batch;
- Sampler's name and project manager contact details;
- Sample identification, date of sampling; sample medium (e.g. water), container information, number of containers and sample preservation;
- Requested analysis, turn around time and limits of laboratory reporting;
- Name of person relinquishing samples to courier or laboratory; and
- Laboratory address and date delivered to laboratory.

Table A: Summary of Soil Sample Preservation and Holding Times

Parameter	Minimum Sample Volume	Sample Preservation	Holding Time
BTEX, TPH, OCP, OPP, PCB, PAH, Phenol, SVOC, VOC, VHC, TOC	20g	4°C	14 days
Metals	20g	4°C	6 mths, Hg and speciated chromium 28 days
TCLP Analysis	100g	4°C	14 days for organics, 6 mths for metals, 28 days for Hg and speciated chromium
Acid Sulphate Soils	20g	4°C Freeze	24 hrs 7 days
Microbiological	125ml	4°C, Sterile, $Na_2S_2O_3$	24 hrs
Asbestos	500ml	Nil	Indefinite

The COC form must accompany the samples submitted to the laboratory to ensure sample traceability. The samples should be transported to the analysing laboratory as soon as possible after collection. Each time the samples change possession, whoever relinquishes and whoever receives the samples must sign, date and time the COC documentation form.

4.5 Sample Jar Filling

Use extra caution when collecting samples that have a medium to high potential to volatilise. Samples for volatile analysis should not be homogenised, combined or composite samples made prior to analysis due to the potential for loss of volatile matter. To prevent loss of volatiles, the soil should be placed in the jar as quickly as possible and filled to the top. Take care to fully fill jars leaving no head-space. Once the jar is filled, immediately screw the cap on tightly. Threads on the jar and lid may need to be cleaned to ensure a tight seal when closed.

4.6 Observation and Recording Information

All daily sampling activities should be recorded on the field sheets, including significant events, sampling locations and numbers, observations, measurements and weather conditions. All entries should be dated and signed.

Field sheets which should be completed during field activities relating to soil sampling include the following:

- Daily Site Activities Sheet;
- Field Observation Form;
- Site sketches;
- Field Screening of Soil / Materials;
- Borehole and/or test pit log;
- Chain of Custody (COC);
- Field QA/QC Register;
- Calibration Register;
- Photographic Log; and
- Survey sheet.

Before sampling complete site information details on the Daily Site Activities Sheet and the Field Observation Form, including the date and time of day. In the comments section note any conditions that may indicate potential for soil contamination to be present (e.g. visual and/or olfactory indicators of contamination, stressed vegetation, location and condition of nearby areas of environmental concern (e.g. tanks, sumps, drains, fill, stockpiles etc), indicators of previous environmental assessments (e.g. boreholes, monitoring wells), ground condition and type of cover.

When recording measurements, write down the unit of measurement immediately the reading is taken. It is best practice to always check the units displayed at the time of measurement and record readings with their unit of measure on the data sheet. The unit of measurement is always displayed on the screen. It is essential for data quality and assurance to record the measurement in the units which the meter is displaying. Some instruments freely switch between units (auto range), so it is good practice to check it each time a reading is recorded. Never convert units in the field. If necessary the units can be later converted in the office at a time when the data is being prepared for a report.

Take photographs of each sample location. Where possible try to show the intersected geology (eg test pit wall) or other specific point of interested (e.g. zones of contamination) and include a scale indicator (e.g. shovel).

Check that the field sheets are filled out completely at each sample location prior to moving on to the next sample location.

It is neither required nor advocated that smelling of samples is necessary. That is, do not 'stick your nose' in or over the sample. If odours are noticed however, then make a record of such and where possible indicate pungency and type of odour.

4.7 Protecting the Environment

It is the Robson field staff members responsibility to ensure that all excavations and boreholes etc are left in a safe condition. Failure to do so could results in Robson and the field staff member being held liable for an accident. It is generally the subcontractors responsibility to backfill excavations and unless otherwise instructed, the Robson field staff member should confirm that the excavations are backfilled. Excavations left open should be clearly barricaded. Use barricades at least 1 m high, brightly coloured and with warning signs. If boreholes are to be left open they should be capped or covered or well protected.

Other factors to be implemented to protect the site include:

- Barricade or demarcate the work area to restrict entry;
- Minimise dust generation;
- Put all rubbish generated into a rubbish bin or remove from site and dispose of appropriately;
- Disturb the site as little as possible during sampling operations;
- Label all waste containers (empty solution bottles can be used for this purpose marked with permanent pen as 'Waste');
- Pour all waste from chemical and physical testing into a waste bottle;
- At contaminated sites, treatment and disposal of contaminated soil cuttings require care to avoid risks to occupational health and safety or pollution of surface water, land or uncontaminated groundwater. Drums and containers used for the storage of such waste awaiting disposal should be clearly labelled as contaminated soil with the name and contact details of Robson and the Project Manager; and
- Dispose of the waste material through an accredited / approved waste disposal service.

5 SOIL SAMPLING METHODS

5.1 Assessment of Stockpiles

Soil stockpiles of unknown quality should be assessed for asbestos contamination. If the stockpile originated from areas not likely to be contaminated (for example, no indication of building activity or waste, then the assessment can consist of a close visual examination over the whole stockpile surface. In the event that any asbestos is found or the soil came from suspect areas or contains indicators of building activity or waste, then the stockpiles should normally be considered as being contaminated.

Surface soil is generally classified as soil between the ground surface and a depth of 0.2 m below the ground surface. Grab samples (e.g. from the surface or from the walls / base of excavations) can be collected using a trowel, shovel or similar. The general procedure for the collection of surface grab samples is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;

5.2 Surface Grab Samples

Surface soil is generally classified as soil between the ground surface and a depth of 0.2 m below the ground surface. Grab samples (e.g. from the surface or from the walls / base of excavations) can be collected using a trowel, shovel or similar. The general procedure for the collection of surface grab samples is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Label sample jars, bottles and bags;
- Collect the sample and place in appropriate sample container. Also collect a sample and place in a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;
- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly. Place jar in ice cooled esky;
- Lithologically log the sample and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**; and
- Either discard or decontaminate all items which came into contact with the sample before proceeding onto the next sampling location.

5.3 Hand Augering

The general procedure for the collection of soil samples using a hand auger is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;
- Ensure that the sample location is clear of underground utilities, and overhead obstructions, utilities and services etc;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Lay out plastic sheeting adjacent to the sampling location to prevent direct contact with the ground surface;
- Label sample jars, bottles and bags;
- Auger to the desired sampling depth or the auger is full of soil. Remember to proceed cautiously and only hand auger at a force that would not cause damage to services if encountered. Carefully remove the auger from the hole. If the desired depth has not been reached, continuing augering and emptying the auger as needed. Emptied soils should be deposited in the plastic ground sheet to facilitate refilling the hole and to

prevent contamination of the surrounding area. Depending upon the borehole depth, additional solid stem flights may need to be attached to the auger;

- Before sampling off the auger stem, remove the outer centimetre or so of the soil to reduce the potential for cross-contamination from fall-in from the upper portions of the hole, or smearing effects when withdrawing the auger from the hole;
- Collect the sample off the auger by collecting in a stainless steel pan or bowl. Once the soil is in the pan it should be mixed thoroughly and then placed in appropriate sample container. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;
- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly and place jar in ice cooled esky;
- Lithologically log the sample and the boring and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**; and
- Either discard or decontaminate all items which came into contact with the sample before drilling and sampling at a deeper depth or before proceeding onto the next sampling location.

5.4 Trenches and Test Pits

The general procedure for the collection of soil samples from trenches or test pits is as follows:

- Where possible, ensure the excavator bucket or backhoe and all equipment to be used for sampling has been decontaminated;
- Ensure that the sample location is clear of underground utilities, and overhead obstructions, utilities and services etc;
- Barricade the work area to restrict entry of unauthorised people. Ensure that trenches and test pits are not left unattended while they are open. Keep equipment and personnel at least 0.6 m away from the excavations edge. Do not enter excavations greater than 1 m in depth;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Lay out plastic sheeting adjacent to the sampling location to prevent direct contact with the ground surface;
- Label sample jars, bottles and bags;
- Excavate to the desired sampling depth or until the bucket/backhoe is full of soil. If the desired depth has not been reached, continuing excavating and emptying the bucket as needed. Emptied soils should be deposited in a stockpile adjacent to the hole to prevent contamination of the surrounding area. In extreme cases, the excavated soil should be placed on plastic sheeting or an impermeable surface, with obviously impacted soil (e.g. stained or odorous material) being segregated from non-impacted soil. Bunding with hay bales and other sediment controls may also be necessary;
- To reduce the potential for cross contamination, the soil sample should be collected from the middle of the excavator bucket as this soil is less likely to have come into

contact with the surface of the bucket itself. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;

- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly and place bottle in ice cooled esky;
- Lithologically log the sample and the trench / test pit and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**;
- Either discard or decontaminate all items which came into contact with the sample before excavating and sampling at a deeper depth or before proceeding onto the next sampling location;
- Depending upon Client requirements, backfill the trench / test pit with the removed soil material and reinstate surface coverings. The backfill material should be compacted with the available plant (eg excavator) to reduce site hazards and obstructions.

5.5 Sampling Using Drilling Rigs

The general procedure for the drilling and sampling of bore holes with a drilling rig is as follows:

- Ensure all equipment to be used for sampling has been decontaminated;
- Check that the plant equipment register indicates recent service. Also, check that the persons undertaking the drilling have adequate qualifications, licences and experience;
- Ensure that the sample location is clear of underground utilities, and overhead obstructions, utilities and services etc. Verify the location of overhead structures and services; do not drill within certain distances of services as per state/territory requirements;
- Remove surface vegetation, leaves and other surface debris not designated for sampling from the vicinity of the area to be sampled;
- Lay out plastic sheeting adjacent to the sampling location to prevent direct contact with the ground surface;
- Label sample jars, bottles and bags;
- Hand auger or use Non-Destructive Drilling (NDD) for the first 1.2 m (or greater depending upon Client requirements), to confirm the absence of underground services;
- Drill to the desired sampling depth or the auger/core barrel/SPT tube is full. Carefully remove the auger/core barrel/SPT tube from the hole. If the desired depth has not been reached, continuing drilling and emptying the auger/core barrel/SPT tube as needed. Emptied soils should be deposited in the plastic ground sheet to facilitate refilling the hole and to prevent contamination of the surrounding area. Cores should be placed in core trays;
- Collect the soil sample from the drilling device. Specific techniques for sampling from the different drilling methods are discussed below in **Sections 5.4.1 to 5.4.4**. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening. Screen sample with PID in accordance with **Section 3.1**;

- Clean the outside of the sample jar and thread to remove excess soil. Replace lid tightly and place bottle in ice cooled esky;
- Lithologically log the sample and the boring and make notes regarding obvious visual and/or olfactory indicators of contamination. Guidance regarding logging is provided in **Section 6**; and
- Either discard or decontaminate all items which came into contact with the sample before drilling and sampling at a deeper depth or before proceeding onto the next sampling location; and
- Ensure that the drilling mast is lowered before moving to new sample locations.

5.4.1 Auger Drilling

Issues specific to collection of soil samples when auger drilling include the following:

- Before sampling off the auger stem, remove the outer centimetre or so of the soil to reduce the potential for cross-contamination from fall-in from the upper portions of the hole, or smearing effects when withdrawing the auger from the hole; and
- Collect the sample off the auger by collecting in a stainless steel pan and then placed in appropriate sample container. Also, a portion of the sample should be placed into a zip lock bag for PID head space screening.

5.4.2 Hammer Drilling

Soil cuttings brought to the surface during hammer drilling can be collected for future reference and/or laboratory analysis, however undertaking chemical analysis of such samples is not normally recommended for the following reasons:

- Loss of volatile compounds. The drilling process requires the injection of compressed air, plus can generate high temperatures at the drill bit, both of which can cause volatilisation of volatile compounds. As a result, analytical results may not be representative of in-situ contaminant concentrations;
- Possibility of cross contamination. Relatively uncontaminated material from depth may come into contact with shallow contaminated material when being brought to the surface;
- The sampling interval is not accurately known as there is a time lag between the cutting of soil at the drill bit face and when the sample is ejected to the surface; and
- Hammer drilling through dry soil and rocks may result in significant dust generation, which could result in an unsafe work environment, contaminant dispersal etc. Dust mitigation measures should therefore be implemented including the use of cyclones, wet hessian sacks covering the outlet pipe, or similar.

5.4.3 Core Drilling

Issues specific to collection of soil samples when core drilling include the following:

- Core barrels typically range in length from 0.5 m to 3.0 m. The core barrel is recovered after each interval is drilled;

- Representative sub-samples of the soil core can be transferred to appropriate sample containers for laboratory analysis or the entire length of core can be placed in core trays should it be necessary to retain them. If placing in core trays, then the core should be placed 'deep' end down in the core tray and the core tray labelled with hole number, depth interval, missing sections due to lack of core recovery etc. In addition, should portions of the core be removed for analysis, then blocks indicating the length and depth interval of the portion removed should be appropriately located within the core tray;
- If it is possible that future sampling of stored core for laboratory analysis may be required, then the core tray should be made of or lined with an inert material to reduce the potential for cross contamination; and
- Core barrels are commonly rusty and have been used on numerous occasions for the collection of contaminated soil samples. As the core sample comes into direct contact with the core barrel it is therefore imperative that the core barrel components are decontaminated prior to use, and between each sample.

5.4.4 SPT and Push Tube Sampling

Issues specific to collection of soil samples when SPT (standard penetration test) drilling or push tube sampling include the following:

- SPT splits are commonly rusty and have been used on numerous occasions for the collection of contaminated soil samples. As the soil samples come into direct contact with the splits it is therefore imperative that the splits and sample catcher are decontaminated prior to use, and between each sample;
- Allow the driller to remove the SPT tube from the borehole and open the split spoon. If using PVC tubes for sample collection, the driller when then cut open the tubes;
- Collect representative soil sample directly from the splits or the PVC tube;
- In some situations where the soils are loose and/or granular, it may not be possible to recover a sample from the splits or tube. In such situations, an idea of the composition of the penetrated soils can be obtained by close inspection of the inside of the splits as a small amount of soil tends to stick onto the split/tube surface; and
- Duplicate samples can be collected from the recovered soil sample by slicing segments of the recovered core into longitudinal sections over the one sampling interval, and transferring the soil from each side to separate containers.

6 LOGGING OF SOIL

Soils should be logged based on visual inspection of the soil sample, soil cuttings and/or exposed in the base and walls of an excavation. In addition, when drilling the environmental scientist should liaise with the drilling to obtain as much possible information as possible regarding the drillers interpretation of the subsurface conditions encountered.

The aim of effective and accurate logging is to ensure that:

- All observable and significant properties of a soil are described and noted;
- Consistent terms and meanings are used to described soils; and
- The properties of the soil are described in the same relative order.

Logging the physical properties of soils should be undertaken using the Unified Soil Classification System (USCS). Soil should be described in the following order:

- USCS classification symbol and ground name, which is based on grain size and physical properties (e.g. clays, silts). Where several components are present, the major component forms the root name and the minor component is used as the modifying adjective (e.g. sandy CLAY – the major constituent is clay and the minor constituent is sand). Recommended USCS classifications are provided in **Table B**;
- Colour. The colour of the soil is described in the moist condition using the colours of the Maunsell Colour Chart. These may be modified by adjective such as 'light' or 'dark'. Borderline colours can be described as a combination of colours. Additional information regarding colour is provided in **Table C**;
- Particle size range or plasticity. Use the descriptors provided in **Table D** based upon particle size;
- Consistency. Indicate whether the soil is cohesive or not;
- Moisture content. Indicate whether the soil is dry, moist or wet;
- Structure. The soil may consist of separate zones differing in colour, grain size or other properties. The patterns of such zones should be described using the following terms:
    - 'Layer' – zone is continuous across the exposure or sample;
    - 'Lens' – a discontinuous layer of different material, with a lenticular shape;
    - 'Pocket' – an irregular inclusion of different material;
- Additional comments indicating soil characteristics such as odours (see **Tables E and F**), evidence of soil contamination, water seepage (both in and out). The abundance of inclusions can also be described based upon criteria outlined in **Table G**; and
- Interpretation of geologic origin (e.g. residual, alluvium, fill material).

With regard to depths, it is important to record the upper and lower limits (in metres) of the various layers, soil horizons and types of fill materials encountered. With regards to odours, it is neither required or advocated that smelling of samples is necessary. That is, do not 'stick your nose' in or over the sample. If odours are noticed however, then make a record of such and where possible indicate pungency and type of odour. Suggested odour descriptions and odour strength are provided below in **Tables E** and **F** respectively.

Table B: Unified Soil Classification System

Major Divisions			Group Symbol	Typical Group Name
Coarse Grained Soils (More than half of material is individual grains visible to the naked eye)	Gravelly Soil (more than half of coarse fraction is larger than 2.36 mm)	Clean Gravel (will not leave a stain on wet palm)	GW	Well graded gravel, fine to coarse gravel
			GP	Poorly graded gravel, predominantly one size or range of sizes with some intermediate sizes missing
		Dirty Gravels (will leave a stain on wet palm)	GM	Silty gravel
			GC	Clayey gravel
	Sandy Soils (more than half of coarse fraction is smaller than 2.36 mm)	Clean Sands (will not leave a stain on wet palm)	SW	Well graded sand, fine to coarse sand
			SP	Poorly graded sand, fine to coarse sand
		Dirty Sand (will leave a stain on wet palm)	SM	Silty sand
			SC	Clayey sand
Fine Grained Soils (More than half of material is individual grains not visible to the naked eye)	Silt and Clay (Liquid limit less than 50)	Inorganic	ML	Silt
			CL	Clay of low to medium plasticity
		Organic	OL	Organic silt or organic clay of low plasticity
	Silt and Clay (Liquid limit greater than 50)	Inorganic	MH	Silt of high plasticity
			CH	Clay of high plasticity
		Organic	OH	Organic clays of medium to high plasticity
Highly Organic Soils			Pt	Peat, muck and other highly organic soils

Table C: Soil Colours

Soil Colour	Potential History or Behaviour
Red	Well drained
Yellow or grey	Poorly drained
Dark soils	Higher levels of organic matter
Bluish or greenish grey (gley colours)	Water logged soils

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

Table D: Particle Size or Plasticity

Term		Grain Size / Description
Boulders		Greater than 200 mm
Cobbles		50 mm to 200 mm
Gravels	Coarse	20 mm to 50 mm
	Medium	6 mm to 20 mm
	Fine	2.36 mm to 6 mm
Sands	Coarse	0.6 mm to 2.36 mm
	Medium	0.2 mm to 0.6 mm
	Fine	0.075 mm to 0.2 mm
Non plastic		A 3 mm thread cannot be rolled at any water content
Low Plasticity		A thread can be barely rolled
Medium Plasticity		A thread is easy to roll
High Plasticity		A thread is easy to roll and can be rerolled several times

Table E: Odour Descriptions

Odour Description	Contaminant Indicated
Characteristic sharp, pungent	Ammonia
Petroleum products	Petrol, diesel, oil
Compost	Decayed organic matter
Putrefied	Putrescible waste
Rotten egg smell (sulphurous)	Anaerobic or acid sulphate conditions
Acidic	Mineral or organic acid
Caustic	Caustic material
Septic	Decaying organic matter, sewage
Sweet, solvent type	Ketone
Aromatic	Benzene

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

Table F: Description of Odour Strength

Strength	Description
Weak	Just detectable; location difficult to determine
Distinct	Detectable immediately adjacent to source, bearable at source
Strong	Detectable 20 m from source, bearable at source
Very Strong	Detectable at distances greater than 20 m from source, pungent at source

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

Table G: Abundance Classes

Description	Visual Estimate (%)
Very few	Less than 2%
Few	2% to 10%
Common	10% to 20%
Many	20% to 50%
Abundant	50% to 90%
Profuse	Greater than 90%

Notes: Sourced from Australian Standard AS4482.1-2005 '*Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-Volatile and Semi-Volatile Compounds*'.

7 FIELD QUALITY ASSURANCE / QUALITY CONTROL

A primary task of any environmental assessment is the implementation of a quality assurance / quality control (QA/QC) program to ensure that the field work program and analytical results obtained are of the highest quality. The requirements of the field QA/QC program should be determined prior to initiating the sampling works using the Data Quality Objective (DQO) process, and then outlines in the SAQP and discussed in the briefing prior to the fieldwork.

On short duration projects (e.g. one round of sampling), the review of the QA/QC process is often undertaken once the analytical results are available. In such cases, review of the QA/QC data is undertaken to assess the integrity of the data. On large projects extending over periods of months or years involving numerous rounds of sampling and or different phases of assessment works, the results of the QA/QC program should be monitored on a continual basis to ensure the integrity of the collected data, and/or to determine the necessity for corrective actions (if required).

7.1 Quality Assurance

Quality Assurance (QA) refers to the procedures to be implemented during the field work. The QA procedures for soil sampling are documented in this SOP. All personnel undertaking soil sampling should be familiar with the contents of this SOP and should carry it in the field with them at all times.

7.2 Quality Control

In essence, the purpose of quality control (QC) samples is to determine the accuracy and precision of the field sampling, transportation and laboratory analysis, and thereby assess whether the results are representative of the waters sampled. All QA/QC samples must be collected, handled and processed in the same exact manner as the other samples being collected.

7.2.2 Field Duplicate Samples

Duplicates are two independent samples which are collected as close as possible to the same point in space and time and are subjected to the same filtering, preservation, holding and analysis methods. These samples are stored in separate containers and analysed independently. Duplicates are used to assess the precision of the field sampling techniques and analytical processes. In addition, a triplicate is a version of a duplicate sample but is sent to a secondary laboratory to confirm the accuracy of the results of the primary laboratory.

Field duplicates and triplicates should be sampled at a rate of one duplicate per 10 primary samples (or parts thereof). If submitted to the primary laboratory, the field duplicate should be labelled with a unique identifier with no reference whatsoever to the corresponding primary sample of the duplicate pair. The field duplicate should be analysed for the same parameters and analytes as the corresponding primary sample of the duplicate pair.

Where possible, duplicate samples should be collected from samples that are known or suspected to be contaminated or contain detectable concentrations of contaminants of concern. In addition, where possible duplicate samples should be collected from over a range of contaminant concentrations so as to enable assessment over the low, middle and high range of contaminant concentrations.

For non-volatiles, the sample is to be homogenised in the field to help ensure a representative sample is place in each of the primary / duplicate / triplicate jars. For volatile and semi-volatile analytes, no mixing shall be undertaken in the filed. Instead, representative duplicates / triplicates shall be prepared by adding incremental portions of the original sample into each jar.

The requirements of the duplicate sampling should be kept in mind during the project to ensure that suitable duplicate samples and a sufficient number of duplicate samples are collected.

7.2.3 Blank Samples

A blank is a sample comprised of deionised water that is carried through all or part of the sampling process. Blanks include the following:

- Trip blanks which are used to monitor potential contamination during transport and storage. They are sent from the laboratory with empty containers and remain unopened with the other samples throughout sampling and transport. As a minimum, one trip blank per day of sampling (or part thereof) should be taken; and
- Rinsate blanks which are used to monitor potential cross-contamination between sample locations and for potential influences from sampling equipment. The rinsate blank is taken from the final rinse of equipment after decontamination. The rinsate blanks should be analysed for the same analytes as the samples. As a minimum, one rinsate blank per day (or part thereof) should be taken.

8 REFERENCES

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9 ABBREVIATIONS

ACM	Asbestos Containing Material
AF	Asbestos Fines
AS	Australian Standard
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
$C_6 – C_9$	Total Petroleum Hydrocarbon fractions
COC	Chain Of Custody
DQO	Data Quality Objectives
eV	Electron Volts
FA	Fibrous Asbestos
f/mL	Fibres per millimetre
HIL	Health-Based Investigation Levels
MSDS	Material Safety Data Sheet
NDD	Non-Destructive Drilling
OCP	Organochlorine Pesticide
OPP	Organophosphate Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Photoionisation Detector
PPE	Personal Protective Equipment
ppm	Parts Per Million
SAQP	Sampling and Analysis Quality Plan
SOP	Standard Operating Procedure
SPT	Standard Penetration Test
SSMP	Site Safety Management Plan
SVOC	Semi Volatile Organic Compounds
TPH	Total Petroleum Hydrocarbon
QA	Quality Assurance
QC	Quality Control
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
USCS	Unified Soil Classification System
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds
w/w	Weight/weight, by weight.