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The University of Sydney

Stage 2 Detailed Site Contamination Investigation

Student Accommodation Development,
000-02 Darlington Road Terraces,
The University of Sydney, Darlington

15 April 2015

When you think with a global mind problems get smaller

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Stage 2 Detailed Site Contamination Investigation

Prepared for:
The University of Sydney

Prepared by
Coffey Geotechnics Pty Ltd
Level 19, Tower B, 799 Pacific Highway
Chatswood NSW 2067 Australia
t: +61 2 9406 1193 f: +61 2 9406 1004
ABN: 93 056 929 483

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Abbreviations

ACM	Asbestos Containing Materials
AEC	Area of Environmental Concern
AHD	Australian Height Datum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
bgs	below ground surface
BH	borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C6-C36	Hydrocarbon chainlength fraction
cm	Centimetre
COC	Chain of Custody
COPC	Chemical of potential concern
CSM	Conceptual Site Model
DP	Deposit Plan
Ha	Hectare
HIL	Health Investigation Level
HSL	Health Screening Level
km	Kilometre
LOR	Limit of Reporting
m	Metre
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
NATA	National Association of Testing Authorities
NSW EPA	Environment Protection Authority of New South Wales
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
ppm	parts per million
QA	Quality Assurance
QC	Quality Control
RAP	Remedial Action Plan
RL	Relative Level
RPD	Relative Percent Difference

SOP	Standard Operating Procedures
SSP	Site Safety Plan
TB	Trip Blank
TP	Test Pit
TPH	Total Petroleum Hydrocarbon
TS	Trip Spike
VOC	Volatile Organic Compounds

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1. Introduction

1.1. General

This report presents the results of a Stage 2 Detailed Site Contamination Investigation prepared by Coffey Environments Australia Pty Ltd (Coffey) for the proposed student accommodation development located at 00-02 Darlington Road, which is located within The University of Sydney – Darlington Campus (the 'site'). The location of the site is shown in Figure 1.

A geotechnical investigation was undertaken concurrently with the contamination investigation, and a summary of findings and recommendations has been provided in a separate report.

Coffey Geotechnics Pty Ltd was commissioned by the University of Sydney to carry out these geotechnical and contamination investigations. These investigations were undertaken in general accordance with our proposal (Ref: GEOTLCOV25176AA-AC, dated 1 October 2014).

1.2. Background

The University of Sydney is seeking to redevelop the site for student accommodation. The Stage 2 Detailed Site Investigation was commissioned to support the Development Application for the proposed development and further assess the significance of potential 'areas of interest' identified within the following document which includes the site:

- SKM (Sept 2010); Phase 1 Environmental Assessment for the 3.6Ha Abercrombie Precinct (Ref: EN02867, Final).

A site layout plan showing the extent of the assessment area is shown on Figure 2.

1.3. Objectives

The objective of the detailed site contamination assessment is to investigate the areas of interest with respect to ground contamination that have been identified within the Phase 1 Environmental Assessment (SKM, Sept 2010), which included:

- Fill materials around the borders of existing buildings – particularly relating to weathered hazardous building products such as heavy metals and asbestos, but also the historic use of pesticides/herbicides, and the unknown origin of fill materials;
- Fuel and chemical storage in Building H07 – University Garage (off-site);
- Chemical storage in the Recycling Centre shed (off-site); and
- Paint, varnish and thinners storage in Building H05 – Joiners Shop (off-site).
- Transformer and generator (off site).

1.4. Scope of Works

To achieve the project objective described above, Coffey carried out the following scope of works outlined below.

- Preparation of a Site Safety Plan (SSP) for the fieldworks;

- Location and clearance of underground services using an experienced services location subcontractor at investigation locations within the site.
- Investigation programme comprising the excavation of six geotechnical soil test pits (TP1 to TP6), four boreholes (BH1 to BH4) at targeted locations and drilling of nine hand auger holes (HA1 – HA9). Collection of soil samples from each test pit, borehole and hand auger location at surface and at regular intervals thereafter, or where there is a change in material type or evidence of potential contamination.
- Conversion of two boreholes (BH1 and BH4) into groundwater monitoring wells and development of the newly installed wells.
- Gauging, purging and collection of groundwater samples from the new installed groundwater monitoring wells.
- Laboratory analysis of selected soil samples and all groundwater samples.
- Interpretation of field and laboratory data and preparation of this report.

1.5. Current Land Use

The site is currently occupied as a student accommodation building known as 00-02 Darlington Road Terraces. The site is mostly covered with concrete. A small grassed area is located in the eastern part of the site and small garden beds/planting areas exist within the rear courtyard of each terrace. A number of mature trees are also located along the southern boundary of the site.

1.6. Proposed Land use

The University propose to redevelop the site by refurbishing the existing Darlington Road Terraces building and constructing four new buildings south of the existing buildings, for student accommodation use.

The proposed development will comprise the construction of four, three level high (including ground level) buildings (as Buildings A to D) to the rear (south) of the existing Darlington Road terraces, and the also refurbishment of the existing terrace buildings. Building B will also include an underground basement level and Building D may include an underground area for an on-site water retention tank of 43KL capacity.

The proposed construction design drawings, provided by the client, are presented in Appendix G.

2. Site Description

2.1. Site Location & Definition

General location information relating to the site is summarised in Table 2.1. The site location and site layout plan is shown in Figures 1 and 2 respectively.

Table 2.1: Site Identification

Site Location:	Between Darlington Road and Darlington Lane, Darlington Campus, The University of Sydney, Darlington, NSW 2008
Site Area	Approximately 0.8Ha
Current Land Use:	Student Accommodation Building
Site Co-ordinates:	33°53'30.00"S 151°11'23.76"E (based on the central location of the site. Source: Google Earth)

2.2. Site Description

A summary of the site features, based on site observations made by a Coffey environmental scientist during investigation works recently completed.

The site is a rectangular piece of land bound by Darlington Road to the north, Codrington Street to the east, Darlington Lane to the south and Golden Grove Street to the west. The northern part of the site is occupied by terrace residential buildings which are currently used for student accommodation. Areas to the rear (south) of the terraces are substantially covered with hard surfaces (e.g. concrete, brick paving etc.). Small soft landscaped areas exist in a number of the terrace plots. Several mature trees also exist in a small number of the terraces along the southern boundary of the site.

An L-shaped grass covered area is present in the eastern end of site.

The topography of the site slopes down from the northwest to the south east

No visual or olfactory indications of contamination had been noted on surface soils during the site works as part of this contamination assessment.

2.3. Surrounding Land Uses

The following uses are noted surrounding the site:

Table 2.2: Summary of Land Uses Surrounding the Site

Direction	Summary of Land Uses
North	Darlington Road beyond which lies a triangular piece of land which comprises university buildings such as Merewether Building, The Sci Tech Library, Institute Building, The Darlington Centre School Building, The Darlington Centre and Sydney University Regiment Building.

Direction	Summary of Land Uses
East	Codrington Street, beyond which lies the Sydney University Sport and Fitness Building.
West	Darlington House; a five-storey student accommodation building adjoins the western boundary of the site. Golden Grove Street and Darlington Public School are situated further to the west.
South	Darlington Lane, beyond which lies an active construction site which has encompassed the University of Sydney Business School, the Recycling Centre, a transformer and the Joiners Shop identified within the Phase 1 Environmental Assessment (SKM, Sept 2014). The University Garage remains to the southwest, beyond Darlington Lane.

2.4. Published Geological and Soils Records

Review of the 1:100,000 Sydney Geological Series 9130 (Geological Survey of New South Wales, Edition 1, 1983) indicates that the site is underlain by Middle Triassic Bringelly shale and Ashfield shale, including Minchinbury sandstone (Wianamatta Group). Bringelly shale comprises of shale, carbonaceous claystone, laminate, fine to medium grained lithic sandstone and rare coal. Ashfield shale is made up of black to dark grey shale and laminite and Minchinbury sandstone is fine to medium grained lithic sandstone.

A review of the 1:100,000 Sydney Soil Landscape Series Sheet 9130 (Soil Conservation Service of NSW, 1983) indicates that the site is located in the residual Blacktown soil landscape. The Blacktown soil landscape group comprises of shallow to moderately deep (<100cm) red/brown podzolic soils in higher relief areas, grading to yellow podzolic soils on lower slopes and out in drainage lines. Other characteristics of this soil landscape are moderately reactive highly plastic subsoil, low soil fertility and poor soil drainage.

2.5. Hydrogeology

Based on the published geological records, it is anticipated that groundwater can be expected within regional aquifer within fractures within the Bringelly Shale and Ashfield shale bedrock. Lenses of perched water may also be present at the soil/rock interface.

As outlined in the Phase 1 Environmental Assessment (SKM, Sept 2010; Ref: EN02867, Final), five known groundwater bores within a 1km radius of the site have been identified during a search of groundwater bore licenses undertaken using the NSW Natural Resources Atlas (NSW-NRA, http://nratlas.nsw.gov.au). Two of these wells are registered as 'Domestic Bores', with the others registered as 'Monitoring Bores'. No registered groundwater wells had been identified within the site.

2.6. Topography & Hydrology

The topography of the site was observed to slope slightly down from northwest to southeast. Topographic imagery data provided in Google Earth confirm site levels fall from 43mAHD in the western end to 34mAHD in the eastern end of the site.

The closest surface water body to the site is Lake Northam, located 800m north east of the site. Another surface water body named Orphan School Creek and stormwater channel is located

approximately 1km north west of site, which discharges into Johnston's Creek located approximately 2km north west of site, which finally flows out into Rozelle Bay located approximately 2.4km north west of site. It is expected that precipitation would either percolate into sub-surface soils (where permeability allows) or enter the stormwater drainage services via off-site kerbside drains along Darlington Road and Darlington Lane.

3. Site History

3.1. Historical Site Uses - Summary

A review of the historical uses of the site is presented within the Phase 1 Environmental Assessment (SKM, Sept 2010; Ref: EN02867, Final). The information has been summarised below:

- The terrace style housing on site appears to be present from as far as 1930. Aerial photographs indicate that these buildings have remained on site since that time, in a relatively unaltered configuration. The use of the site remains unclear prior to 1930.
- Land surrounding the site during 1930 this time appeared to be used predominantly for residential uses (terrace housing) with some larger buildings (possibly commercial/industrial uses) noted to the south (i.e. where the Joiner Shop was established), and on land to the east. Land to the north appeared sparsely developed at this time, with areas of grass/landscaping noted. .
- Land surrounding the site underwent some changes during the period between 1930 and 1970. The University Garage structure was established immediately to the southwest of site in c.1943.The triangular portion of land to the north of the site was developed further, with several buildings, and on-site parking facility added during this period.
- From early 1980's onwards, a number of buildings around the site had been demolished including one structure adjoining the western boundary of the site. These cleared areas were either vacant or used for car parking. The University Garage building remains to south west of site. New buildings were erected north east of site and most likely associated with the University.
- By the early 1990's, several additional buildings were established within the surrounding land to the north, east and west of the site. Around 2000, the land immediately south of the site, beyond Darlington Lane, was substantially cleared of buildings. The Economics and Business Building and a number of smaller structures consistent with the recycling centre noted in the Phase 1 Environmental Assessment (SKM, Sept 2010) were established to the south of the site c.2003.
- Land to the south/southwest of the site beyond Darlington Lane is currently a large construction site, which has encompassed the Recycling Centre.

4. Previous Assessments

4.1 Phase 1 Environmental Assessment Report, Abercrombie Street Economics Precinct Development, The University of Sydney (SKM, 2010)

Coffey reviewed the Phase 1 Environmental Assessment Report prepared by SKM for the Abercrombie Street Economics Precinct Development, which includes the site. The Phase 1 Environmental Assessment was prepared based on a site walkover and desk-based review of information held by the University and other publicly available data (e.g. aerial photographs, land title records, geological map extracts, etc.).

The Phase 1 Environmental Assessment identified the following Areas of Interest:

- Fill materials around the borders of existing buildings – particularly relating to weathered hazardous building products such as heavy metals and asbestos, but also the historic use of pesticides/herbicides, and the unknown origin of fill materials;
- University Garage located offsite to the southwest where fuel was stored in two underground storage tanks (UST) that were subsequently abandoned in 1998. SKM also note the storage of oils and other chemicals occurred in this facility.
- Fertilizer storage in the former Recycling Centre shed - offsite to the south; and
- Joiners Shop Paint located offsite to the south where up to 300L of paint/lacquer/varnish and up to 30L of thinners were stored.
- Transformer and generator – offsite to the south.

The location of the Areas of Interest is shown on Figure 2.

It is noted that SKM refers to a Stage 2 Contamination Assessment that had been prepared by AECOM at the University Garage building in 2009. However, details of the assessment had not been available to SKM at the time of the Phase 1 Assessment. Coffey was not provided with this assessment report for review as part of this study.

SKM recommended an intrusive Stage 2 investigation to be carried out within the subject area to further characterise the potential risks associated with the areas of interest identified.

4.2 Investigation Data Gaps and Uncertainties

The following data gaps and uncertainties were identified following a review of historical site records and data from previous investigation (SKM, Sept 2010):

- There is insufficient information available to describe the use of the site, prior to 1930.
- A review of historic land uses has identified a number of areas of interest where potential contamination may exist. The presence of contamination within soils and groundwater on site is unknown.

5 Areas of Environmental Concern & Chemicals of Potential Concern

5.1 Areas of Environmental Concern

Based on the findings of the previous investigations and data obtained for the site, the following areas of environmental concern (AEC) were identified within and adjacent to the site:

1. Fill materials around the borders of existing buildings – particularly relating to weathered hazardous building products such as heavy metals and asbestos, but also the historic use of pesticides/herbicides and unknown origin of fill materials.
2. Fuel and chemical storage in University Garage Building offsite to the southwest.
3. Chemical storage in the former Recycling Centre Shed – offsite to the south.
4. Paint, varnish and thinners storage in former Joiners Shop offsite to the south.
5. Former transformer and generator offsite to the south.

5.2 Contaminants of Potential Concern

Based on results of previous assessment, the following contaminants of potential concern (COPCs) have been identified in the soil beneath the site:

- Total Petroleum hydrocarbons (TPH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX) compounds
- Heavy metals (Arsenic, Cadmium, Chromium (total), Copper, Mercury, Nickel, Lead and Zinc);
- Polycyclic aromatic hydrocarbons (PAHs);
- Asbestos;
- Polychlorinated biphenyls (PCB);
- Organochlorine pesticides (OCP);
- Organophospherous pesticdes (OPP) and
- Phenols.

Table 5.1 presents a summary of the COPC associated with the AEC identified.

Table 5.1: Potential Contaminants of Concern

AEC	COPC						
	Heavy Metals	PAH	TPH & BTEX	OCP / OPP	Phenols	PCB	Asbestos
Fill (Onsite)	X	X	X	X	X	X	X
Joiners Shop (Offsite)	X	X	X				
Garage (Offsite)	X	X	X				

AEC	COPC						
	Heavy Metals	PAH	TPH & BTEX	OCP / OPP	Phenols	PCB	Asbestos
Recycling Shed (Offsite)	X			X			
Transformer & Generator (Offsite)	X	X	X		X	X	

6 Field and Analytical Programme

6.1 Scope Overview

The scope of the investigation comprised both systematic and judgemental based sampling locations. Based on the size and layout of the assessment area, and AEC identified, the investigation included the following types of sampling locations:

- Sampling from six test pits (TP01 to TP06) and four boreholes (BH1 to BH4) established across the site.
- Additional sampling of shallow soils in nine hand augured boreholes (HA1 to HA9) targeting shallow fill surrounding the building façade.

The approach of adopting the above sampling investigations is considered consistent with the guidance provided within the *Sampling Design Guidelines* (NSW EPA, 1995). The increased sampling density aimed to provide better characterisation of shallow fill materials, particularly where weathered hazardous building materials and pesticide/herbicide residues may concentrate.

Test pit, borehole and hand auger logs for locations completed during this investigation are provided in Appendix A.

Selected soil samples collected from the above investigation locations were submitted to laboratories who hold NATA accredited methods for the analytes requested. In summary, selected soil samples were analysed for the COPCs including:

- Total Petroleum Hydrocarbons (TPH),
- Benzene, Toluene, Ethylbenzene, Xylene isomers (BTEX),
- Polycyclic Aromatic Hydrocarbons (PAH)
- Heavy metals (As, Cd, Cr (Total), Cu, Hg, Ni, Pb, and Zn).
- Polychlorinated biphenyls (PCB),
- Organochlorine pesticides (OCP),
- Organophosphorous pesticides (OPP), and
- Phenols

Samples were selected for analysis based on sample observations including staining and odour. Further details regarding investigation methodology are provided in the following sections.

Selected samples were also scheduled for the analysis of the following parameters to justify the use of ecological investigation levels in accordance with *Schedule B1 Guideline on Investigation Levels for Soil & Groundwater* (NEPC, 2013):

- Soil pH, and
- Cation Exchange Capacity,

Asbestos and particularly asbestos containing materials (ACM) are commonly found in building wastes, rubble and in fill. Our approach to the assessment of asbestos was for visual observation for the presence of asbestos in the form of ACM during the investigation works, particularly within areas of fill that are considered to represent the highest risk of asbestos contamination. This approach is in accordance with the amended ASC NEPM (NEPC, 1999).

Selected samples were also scheduled for leachability analysis as per the toxicity characteristic leaching procedure (TCLP) to inform the assessment of Waste Classification of soil materials in accordance with the Waste Classification Guidelines (NSW EPA, Nov 2014).

Two of the four soil boreholes were converted into groundwater monitoring wells to facilitate the assessment of groundwater quality beneath the site.

Groundwater samples collected from the investigation locations were submitted to laboratories who hold NATA accredited methods for the analytes requested. In summary, selected groundwater samples were analysed for a range of chemical parameters including:

- Benzene, Toluene, Ethylbenzene, Xylene isomers (BTEX), and
- Heavy metals (As, Cd, Cr (Total), Cu, Hg, Ni, Pb, and Zn).

Due to poor well recharge and subsequent recovery of insufficient sample volume, other COPCs including TPH PAH, Phenol could not be analysed.

6.2 Investigation & Soil Sampling Methodology

In general, the investigation and soil sampling methodology was carried out as outlined in Table 6.1.

Table 6.1: Soil Investigation and Sampling Methods

Activity	Detail / Comments
Below Ground Service Clearance	A DBYD underground services check was carried out prior to commencement of works. Investigation locations were also scanned by an underground service clearance sub-contractor.
Test Pits	Each test pit was excavated using hand tools to depths between 0.8 and 1.2mbgs. These excavations were positioned to fill material and residual soils adjacent to the terrace buildings within the site. These excavations were progressed into the soil to assess the characteristics of the materials adjacent to the terrace buildings.
Borehole drilling	Hand auguring was used initially to progress each borehole to a suitable depth to minimise the potential to damage undetected below ground services. Each borehole was then drilled using solid auger techniques to the target depth of investigation.
Hand Auguring	Shallow soil sample locations were progressed using a hand auger to depths of 0.1mbgs. The hand auger was decontaminated between the sample locations.
Soil Sampling	All soil sampling works were carried out by an appropriate qualified and experienced Coffey scientist/engineer. Coffey carried out the sampling using a clean nitrile gloved hand or trowel in accordance with Coffey's Standard Operating Procedure (SOP). In general, soil samples were collected from the surface soils and then at regular intervals thereafter, or targeting different horizons or lenses of potential contamination based on field observations. Soil samples were collected from the test pit excavation face/base using trowel or gloved hand. Soil samples were collected from the auger bit or split tube sampler from the boreholes. Soil samples from the hand augured bores were collected directly from the hand auger bit. Soil samples were placed into sample jars provided by the laboratory. Sample jars were filled to the top to further minimise the loss of volatiles during storage and transit.
Soil Screening	Field headspace screening using a Photoionisation Detector (PID) was undertaken to assess the potential presence of volatile organic compounds (VOC) to guide the scheduling of chemical testing.

Activity	Detail / Comments
	Sample material was placed inside a sealed plastic bag for headspace screening. Soil samples were screened using a PID with a 10.6eV lamp, which was calibrated at the start of the project using isobutylene calibration gas by the equipment supplier company (Thermofisher). Equipment calibration records are provided in Appendix E. Headspace screening results are included on the Test Pit, Borehole and Hand Auger Logs (refer Appendix A).
QA/QC Samples	To measure the accuracy and precision of the data generated by the field and laboratory procedures carried out in this assessment, two (2) intra-laboratory duplicate and one (1) inter-duplicate soil samples were collected and analysed for the same chemicals the parent sample was analysed for. In addition, one trip blank sample (TB1), one trip spike sample (TS1), and one rinsate blank (R1) were collected during the soil sampling programme for QA/QC purposes. The rinsate blank sample was collected off the hand auger, after cleaning it thoroughly with decon 90 solution and potable water.
Soil Splitting	Duplicate samples were collected by dividing one soil sample into two laboratory jars.
Sample Handling and Transportation	Sample collection, storage and transport were conducted in general accordance with the SOP. Soil samples were immediately placed into laboratory supplied glass jars, with Teflon lined seals to limit possible volatile loss and placed into an ice chilled cooler. The samples were dispatched to the laboratory under chain of custody.
Decontamination of sampling equipment	Non-disposable sampling equipment used included a hand auger, trowel and the split tube sampler which were decontaminated by scrubbing with decon 90 mixed with water and rinsed with clean potable water and dried using paper towel between samples.

6.3 Well Construction & Groundwater Sampling Methodology

Details of the well construction and groundwater sampling methodology is summarised in Table 6.2

Table 6.2: Well construction and Groundwater Sampling Methodology

Activity	Detail / Comments
Well Construction and Development	Soil bores BH1 and BH4 were converted into groundwater monitoring wells in accordance with the Coffey SOP. Each monitoring well was constructed using a 50mm diameter PVC slotted screen and casing. The well annulus was backfilled with clean graded sand in the screened interval and then sealed with a bentonite plug placed above the screen. The remainder of the annulus was backfilled with cement grout. Each well was then sealed using a flush fitting lockable cover. Well construction details are shown on the borehole logs presented in Appendix A. All new wells were developed on 30 January 2015. All wells installed during this investigation were reported to have poor recovery following development.
Well Location & Gauging	The two new wells installed as part of this investigation were gauged on 6 February 2015 using an oil/water Interface Probe (IP) to assess the depth to groundwater and the presence of Non-Aqueous Phase Liquid (NAPL).

Activity	Detail / Comments
Well Purging & Sampling Method	Well purging and groundwater sampling was undertaking on 6 February 2015. Groundwater was purged from each monitoring well prior to the collection of a sample for analysis. Each well was purged dry using a disposable bailer in general accordance with the relevant Coffey SOP. A new bailer and bailer cord was used for each monitoring well. During purging, groundwater quality parameters (i.e. pH, temperature, dissolved oxygen, electrical conductivity and redox potential) were recorded. Groundwater field data sheets are presented in Appendix F.
QA/QC Samples	No intra-laboratory duplicate groundwater sample or inter-laboratory duplicate groundwater sample were collected and analysed for the COPC due to insufficient sample recovery from the wells. However, one trip spike sample (TS), one trip blank sample (TB) and one rinsate blank sample (RB) were collected and analysed for QC purposes.
Sample Handling and Transportation	Sample collection, storage and transport were conducted in general accordance with the relevant Coffey SOP which is based on industry standards. Groundwater samples were immediately placed into laboratory supplied bottles with appropriate preservatives, with Teflon lined seals and placed into an ice chilled cooler. Samples proposed for metals analysis were also filtered in the field using 0.45micron filter. The samples were dispatched to NATA accredited laboratories under chain of custody control.
Decontamination of sampling equipment	All non-disposable sampling equipment was decontaminated with approximately 5% Decon 90 solution in potable water, and rinsed with potable water prior to use and between each sample location.
Disposal of purged groundwater	Purged groundwater was placed in sealed water containers for off-site disposal by a licensed contractor.

6.4 Laboratory Details

Analysis was carried out by the following NATA accredited Australian laboratory:

- Primary and intra-lab duplicate soil samples were analysed by Eurofins MGT (Lane Cove, NSW).
- Inter-lab duplicate samples were analysed by ALS Environmental (Smithfield, NSW).

6.5 Quality Assurance/Quality Control

A quality assurance/quality control plan was designed to achieve a number of data quality objectives (DQOs) and to demonstrate accuracy, precision, comparability, representativeness and completeness of the data generated and the procedures for assessing whether the DQOs are met. The QA/QC Plan included:

- Adherence to the relevant Coffey SOPs for the relevant field activities undertaken,
- The investigation field works was undertaken by a Coffey engineer/scientist with experience in carrying out investigations of this sort.
- The collection and analysis of duplicate, trip blank/spike and rinste blank samples., and
- The use of laboratories who hold NATA accredited methods for the analytes requested.

A QA/QC data validation assessment is presented in Appendix B. In summary, the Data Validation Assessment presented in Appendix B concluded that the field and laboratory data were directly useable within the assessment.

6.6 Analytical Results

Soil analytical results are summarised in Tables 1 to 8 which are provided in Appendix C. A discussion of the laboratory data relevant to the proposed development is discussed in Section 8.

Certified laboratory reports and Chain of Custody records are included in Appendix D.

7 Assessment Criteria

7.1 Basis for Assessment Criteria

The assessment criteria applied in this project were sourced from:

- NEPC (1999) 'National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM), Schedule B1: Guideline on Investigation Levels for Soil and Groundwater' (as repealed and replaced 2013);
- Friebel and Nadebaum (2011); 'CRC Care Technical Report No. 10 – Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater';
- ANZECC & ARMCANZ (2000), National Water Quality Management Strategy, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, and
- NHMRC & NRMMC (2011), Australian Drinking Water Guidelines.

The ASC NEPM (NEPC, 1999) describes the soil, soil vapour and groundwater criteria that can be used to evaluate potential risks to human health and ecosystems from site contamination. The criteria are applicable to generic land use scenarios and include consideration of, where applicable, the soil type and depth of contamination.

Investigation and screening levels presented in NEPC (1999) are applicable to the first stage of site assessment and to assist in the iterative development of a Conceptual Site Model (CSM), allowing for appropriate evaluation of human health and ecosystem risks. They are adopted in this report as concentrations of a contaminant above which either further appropriate investigation and/or evaluation will be required, or development of an appropriate management strategy (including remediation).

NEPC (1999) notes that the application of the investigation and screening levels are subject to a range of limitations, as described below.

Table 7.1: Investigation and Screening Levels

Investigation Criteria	Description
Health Investigation Levels (HILs)	HILs have been derived for a broad range of (non-volatile) metals and organic substances and are applicable for assessing human health risk via all relevant pathways of exposure, and for all soil types. The HILs adopted in this assessment were applied to soils at all depths for further consideration in the CSM.
Health Screening Levels (HSLs)	HSLs have been derived for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physicochemical properties, generic land use scenarios, and the characteristics of building structures (NEPC, 1999). Guidance is provided within Friebel and Nadebaum (2011) for HSLs for hydrocarbon compounds only (BTEX, TPH and naphthalene) for direct contact pathways. These HSL have been adopted where HSL associated with soil vapour pathway is Non Limiting. Friebel and Nadebaum (2011) also note that the HSLs are human

Investigation Criteria	Description
	health-based criteria and do not consider other issues that may be required to be addressed, such as aesthetics, ecological risk or other regulatory requirements. The adopted/ derived HSLs along with basis for application, is provided in Section 7.3 below.
Ecological Investigation Levels (EILs)	EILs have been derived for selected (non-volatile) metals and organic substances and are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2m of soil (NEPC, 1999).
Groundwater Investigation levels (GILs)	GILs are based on Australian water quality guidelines (ANZECC & ARMCANZ 2000) and drinking water guidelines (NHMRC & NRMMC 2011) and are applicable for assessing human health risk and ecological risk from direct contact (including consumption).

Further, NEPC (1999) notes that the investigation and screening levels are also not to be applied as default remediation criteria.

7.2 Exposure Settings and Application

The ASC NEPM (NEPC. 1999) presents health and ecological based soil investigation levels for various exposure settings. Coffey understands that the site will be developed for student accommodation residential use as noted in Section 1.6.

It is noted that the proposed land use falls under the generic Residential with minimal soil access land use setting described within the ASC NEPM (NEPC, 1999). Similarly, workers undertaking future site redevelopment activities also fall under this land use setting.

In summary, the following exposure settings and associated HIL and HSL were adopted for this assessment:

Table 7.2: Exposure Settings and Associated HIL, HSL and EIL

Exposure Setting	Source of Health Assessment Criteria
Residential with minimal access to soil (e.g. housing with fully and permanently paved yard space such as high rise buildings and apartments) and construction workers	• NEPC (1999) Schedule B1: Table 1A(1),Column B - Health Investigation Levels for Residential B (HIL B). • NEPC (1999) Schedule B1: Table 1A(3), Health Screening Level for low – high density Residential (HSL A & HSL B) • NEPC (1999) Schedule B1: Tables 1B(1) to 1B(6) – Ecological Investigation Levels for Urban Residential/Public Open Space. • Friebel and Nadebaum (2011); Direct Contact HSL for Residential (High Density) land uses. • Friebel and Nadebaum (2011); Limiting Criteria for groundwater vapour intrusion for High-Density Residential (HSL B)

For application of the above criteria, the following key assumptions (based on this assessment) have been made:

- Contamination depth in soils is conservatively assumed to be between ground surface and less than 1mbgs;
- The assessment criteria selected conservatively assumes that the soil type at the site comprises coarse grained soils (sand).

7.3 Soil Assessment Criteria

7.3.1 Health Criteria

A summary of the adopted health-based soil investigation levels is provided in Table 7.3, below. Table 1 in Appendix C provide a summary of the laboratory data compared against the adopted health based soil investigation levels.

Table 7.3: Soil Investigation Levels – Human Health

Chemical Constituent	Residential with minimal accessible soil Adopted from HIL B & HSL B[1] (mg/kg)
Arsenic	500
Cadmium	150
Chromium (Total)[4]	500
Copper	30000
Mercury	120
Nickel	1200
Lead	1200
Zinc	60000
F1 (TPH C_6-C_9 – BTEX)	45 [2]
F2 (TPH C_{10}-C_{16} – Naphthalene)	110 [2]
F3 TPH C_{16}-C_{34}	5800 [5]
F4 TPH C_{34}-C_{40}	8100 [5]
Benzene	0.5 [2]
Toluene	160 [2]
Ethylbenzene	55 [2]
Total Xylene	40 [2]
Naphthalene	3 [2]
Carcinogenic PAH as Benzo(a)pyrene TEQ [3]	4
Total PAH	400
Aldrin and Dieldrin	10
Chlordane	90
DDT/DDE/DDD	600

Chemical Constituent	Residential with minimal accessible soil Adopted from HIL B & HSL B[1] (mg/kg)
Endosulfan I / II	400
Endrin	20
Heptachlor	10
Hexachlorobenzene	15
Methoxychlor	500
Toxaphene	30
Total PCB	1
Phenol	45000
Pentachlorophenol	130
Cresols	4700

Notes:

1. *Table 1A(1) - Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 1999) unless stated.*
2. *Table 1A(3) - Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 1999) for Sand <1m unless stated.*
3. *TEQ = Toxicity Equivalent Quotient*
4. *Soils were tested for Total Chromium, which comprises both Chromium (III) and Chromium (VI). The HIL for Chromium (VI) has been adopted as a conservative assessment threshold.*
5. *Direct contact pathway (Friebel & Nadebaum, 2011).*

7.3.2 Ecological Investigation Levels

NEPC (2013) provides ecological investigation levels (EIL) that are considered protective of terrestrial ecosystems, with levels of protection for the following land uses:

- Residential with garden and accessible soils
- Commercial/industrial development

As outlined within Schedule B5a of NEPC (2013), EILs apply principally to soils that correspond to the root and habitation zone for many species. For this assessment, this is considered to be the top 2m of soil.

Table 7.4 summarises the EILs adopted for this assessment. Where applicable, assumptions about soil properties used in deriving an EIL are provided as footnotes to Table 7.4. Table 3 in Appendix C summarise the comparison between the soil analytical data and the ecological investigation levels summarised below.

Table 7.4: Ecological Investigation Levels

Chemical Constituent	Ecological Investigation Levels
	Urban Residential/Public Open Space (mg/kg)
Arsenic	100 [1]
Chromium (III) [7]	190 [2]
Copper[7]	240 [3]

Chemical Constituent	Ecological Investigation Levels
	Urban Residential/Public Open Space (mg/kg)
Nickel[6]	310 [4]
Lead	1100 [5]
Zinc[8]	950 [6]
F1 (TPH C_6-C_9 – BTEX)[7]	180
F2 (TPH C_{10}-C_{16} – Naphthalene) [7]	120
F3 (TPH C_{16}-C_{34}) [7]	1300
F4 (TPH C_{34}-C_{40}) [7]	5600
Benzene[7]	65
Toluene[7]	105
Ethylbenzene[7]	125
Xylenes[7]	45
Naphthalene	170
Benzo(a)pyrene[7]	0.7
DDT	180

Notes:

1. Table 1B(5) - Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 2013)
2. The Added Contaminant Limit (ACL) selected for Chromium III conservatively assumes a clay content of 1%.
3. The ACL selected for Copper uses the mean soil pH of 7.2, CEC of 25cmol$_c$/kg and Total Organic Carbon of 1%.
4. The ACL selected for Nickel uses the mean CEC of 25cmol$_c$/kg.
5. Table 1B(4) - Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 2013)
6. The ACL selected for Zinc uses the mean soil pH of 7.2, CEC of 25cmol$_c$/kg.
7. EIL for TPH F1 to F4, BTEX and Benzo(a)pyrene compounds assume soils are fine grained.
8. ABC were adopted for NSW assuming high traffic volume, where relevant.

7.4 Groundwater Assessment Criteria

7.4.1 Groundwater HSLs for Vapour Intrusion

The HSLs adopted for vapour intrusion for volatile hydrocarbon constituents comprise the Limiting Criteria derived using methodology described in Appendix F7 and F6 of *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater - Part 1* (Friebel and Nadebaum, 2011).

Table 7.5 summarises the groundwater health screening levels for BTEX and Naphthalene adopted for this assessment. Table 7 in Appendix C illustrate a comparison between the groundwater analytical data and the adopted health based investigation levels.

Table 7.5: Summary of groundwater HSL for vapour intrusion

Chemical Constituent	Groundwater Health Screening Levels Low – High Density Residential (HSL A and HSL B[1]) (mg/L)
Benzene (non-threshold)	0.8

Notes:

1. HSLs assume a Sandy soil and groundwater occurs between 2m to 4m below ground surface.

7.4.2 Groundwater Investigation Levels

The ANZECC/ARMCANZ (2000) guidelines provide Trigger Values for organic and inorganic chemicals in freshwater and marine aquatic environments. The nearest surface water receptors are the freshwater Lake Northam and Orphan School Creek and associated stormwater channel which is likely to have been impacted (to varying degrees) by urban run-off. As such, the screening criteria selected for the site are the freshwater aquatic criteria for moderately disturbed ecosystems (95% level of protection).

ANZECC/ARMCANZ (2000) states that there is currently insufficient data to derive high reliability trigger values for various contaminants. For these contaminants, low reliability trigger values have been adopted as initial screening levels.

A number of registered groundwater bores have been identified within a 1km radius of the site, as reported by SKM in the Phase 1 Environmental Assessment for the 3.6Ha Abercrombie Precinct (SKM, Sept 2014; Ref: EN02867, Final). These bores are licensed to abstract groundwater for a number of purposes including monitoring and domestic uses. Although reticulated drinking water is readily available in areas surrounding the site, it is considered appropriate to assess groundwater quality against the health-based guideline values presented in the Drinking Water Guidelines (NHMRC/NRMMC, 2011) to reflect potential health risks associated with consumption of groundwater, either via a licensed bore in use for domestic purposes, or through incidental exposure associated with recreational or irrigation uses.

NSW DECC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination* states that where the generic groundwater assessment criterion is below the laboratory LOR, the LOR should be used instead of the existing generic investigation levels.

A summary of the adopted groundwater investigation levels for analytes scheduled for analysis is presented in Table 7.6. Groundwater results are summarised in Table 7 in Appendix C, which illustrates the comparison between the groundwater analytical data and the groundwater investigation levels outlined below.

Table 7.6: Summary of Groundwater Investigation Levels

Analyte	Laboratory Limit of Reporting	ANZECC 2000 95% Trigger Values[(1)] (µg/L)	Drinking Water Guidelines[(2)] (µg/L)	Adopted Groundwater Investigation Level (µg/L)
METALS				
Arsenic	1	13	10	10
Cadmium	0.1	0.2	2	0.2
Chromium	1	1	50	1
Copper	1	1.4	2,000	1.4
Lead	1	3.4	10	3.4
Mercury	0.1	0.6	1	0.6
Nickel	1	11	20	11

Analyte	Laboratory Limit of Reporting	ANZECC 2000 95% Trigger Values(1) (µg/L)	Drinking Water Guidelines(2) (µg/L)	Adopted Groundwater Investigation Level (µg/L)
Zinc	5	8	-	8
ORGANICS				
Benzene	1	950	1	1
Toluene	1	180 (LR)	800	180
Ethylbenzene	1	80 (LR)	300	80
Xylene (m&p)	2	75(LR)(a)	-	75(LR)(a)
Xylene (o)	1	350(LR)	-	350
Xylenes	3	-	600	600

(1) Australian and New Zealand Environment and Conservation (2000) *National Water Quality Management Strategy - Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Trigger values under the 95% protection level for freshwater – where biological or chemical data has not been gathered for a slightly to moderately disturbed ecosystem.

(2) National Health and Medical Research Council and Natural Resource Management Ministerial Council (2011) *Drinking Water Guidelines*.

(LR) Low Reliability trigger values for 95% protection level, due to its potential bioaccumulation effects, recommended by ANZECC/ARMCANZ (2000). To be used as an indicative interim working level only.

(a) Trigger level adopted for Xylene (m&p) is the low reliability trigger level for Xylene (m) as set out within ANZECC (2000).

7.5 Soils – Other Considerations

7.5.1 Aesthetic Criteria

Although no specific numeric aesthetic guideline values are provided, NEPC (1999) requires the consideration of aesthetic issues (as a result of contamination), arising from soils within the site. The following assessment criteria were adopted when considering soil aesthetics:

- no highly malodourous soils, taking into consideration the natural state of the soil;
- no staining or discolouration in soils , taking into consideration the natural state of the soil; and
- no large or frequently occurring foreign materials present (to the extent practicable);

7.5.2 Management Limits

Section 2.9 of NEPC (1999) presents Management Limits for TPH fractions for the protection of buried infrastructure, or the formation of Non Aqueous Phase Liquid (NAPL). The management limits presented within NEPC (1999) have been used for a comparative basis to identify issues to buried infrastructure and the formation of NAPL has also been considered within this assessment.

7.5.3 Waste Classification Criteria

The waste classification of the material was undertaken in general accordance with the procedures for classifying waste as detailed in ‘Waste Classification Guidelines - Part 1: Classifying Waste’ (NSW EPA, Nov 2014).

8 Investigation Findings

8.1 Generalised Subsurface Conditions

Table 8.1 presents a summary of the soil units encountered within the investigation. Test pit, borehole and hand auger logs are presented in Appendix A.

Table 8.1: Summary of Ground Conditions Encountered

Soil Unit	Description
Fill Material	Fill materials were encountered in all investigation locations to depths ranging between 0.1m and >1.0m (BH1). Fill materials typically comprised a sandy Silt to sandy silty Gravel, underlain by, orange brown mottled Clay or silty or gravelly Clay in some locations. Gravels typically comprised fine to coarse grained, pale brown, pale grey, dark brown to orange brown, subangular to angular gravels, and brick fragments and some tree roots. Trace ironstone and limestone gravel were also observed within the fill. In some locations within the southern part and western end of site, fill material comprised predominantly silty to sandy Clay. Other anthropogenic materials encountered within the fill included glass, ceramic and porcelain, concrete and plastic. No asbestos containing material was observed to be present within the fill. With the exception of an organic odour noted in fill material at BH1, BH3 and TP06, no distinct odours or visible discolouration were noted. The maximum soil headspace measurement taken from samples was 10.4ppm, with the remaining majority of measurements less than 5ppm. These measurements indicate a low likelihood for Volatile Organic Compounds (VOC) being present.
Residual Soils	Residual soils were encountered beneath the fill materials in the borehole and test pit investigation locations and typically comprised medium plasticity, orange-pale brown/mottled to grey dry to moist, stiff silty Clay. Trace sand, gravel and ironstone gravel were also present within residual soils in some locations within the western part of site. Residual soil in BH4 showed red-brown iron staining. No visible or olfactory indications of potential contamination were noted in the residual soils encountered in this investigation.
Bedrock	Bedrock was encountered in boreholes only at depths of 1.6mbgs to 3.0mbgs and comprised extremely weathered, red-brown to mottled pale grey extremely weathered Shale. No visible or olfactory indications of potential contamination were noted within the Shale bedrock.

Groundwater seepage was encountered in BH1 at 0.9mbgs, and at depths ranging between approximately 0.65m and 3.0mbgs in BH3. No olfactory/visible indications of potential groundwater contamination were noted at these locations.

In summary, these observation and field measurements indicate that the Areas of Interest identified off-site to the south have not resulted in perceptible contamination impacts to ground conditions within the site.

8.2 Soil Conditions

8.2.1 General

A selection of soil samples collected from the test pits, boreholes and hand auger holes established across the site were submitted for laboratory analysis. A summary of these results compared to the relevant assessment criteria are presented in the following tables in Appendix C:

- Table 1 – Comparison of soil analytical results against health investigation levels for High Density Residential Uses,
- Table 2 – Comparison of soil analytical results against TPH Management Limits In Soil,
- Table 3 – Comparison of soil analytical results against ecological investigation levels for High Density Residential Uses ,
- Table 4 – Comparison of soil analytical results against Waste Classification Criteria
- Table 5 – Comparison of soil leachate analytical results against TCLP Waste Classification Criteria
- Table 6 – Comparison of Primary & Duplicate Samples for Quality Control Purposes
- Table 7 – Analytical Data for Field Quality Control Samples
- Table 8 – Groundwater Analytical Data

A summary of the assessment findings is provided in the following sections of the report.

8.2.2 Human Health

Materials suspected to contain asbestos were not observed within soils encountered at any of the sampling locations.

In summary, the soil analytical results reported soil concentrations below the adopted health assessment thresholds, with the exception of lead, PAHs compounds Benzo(a)pyrene TEQ and naphthalene and Total PAHs.

Lead impacted materials were reported in shallow soils in ten of the sample locations; namely in BH1, BH4, TP5, TP6, HA1, HA3, HA4, HA5 and HA9. The elevated levels of lead in the soils are considered likely to be attributed to the weathering and subsequent deposition of lead based paint from the terrace houses on site.

Elevated concentrations of benzo(a)pyrene TEQ were reported in shallow soils in all sample locations, except at BH2, HA2 and TP1. Concentrations exceeding the adopted criteria for Total PAHs were reported in shallow soils at sampling locations BH3, HA5, TP4, TP5 and TP6, which is generally in the central and eastern parts of the site.

Samples that reported the highest concentrations of Benzo(a)pyrene TEQ and Total PAHs were collected from shallow fill (0.0-0.2mbgs). Samples collected from deeper fill materials and residual soils reported significantly lower concentrations of these constituents. The ratio of Benzo(a)pyrene to Total PAH ranged between 10% and 17%, which indicates that likely source of PAH detected in these samples is ash, rather than another source of hydrocarbon (e.g. oil, diesel fuel etc.). These lines of evidence indicate that the likely source of PAH impact detected in shallow soils relates to the periodic deposition of ash from fireplaces within the terrace housing on site.

Elevated concentrations of naphthalene was also reported at sampling locations BH3, HA4, HA5, TP4 and TP5, which is within the central part of the site. These samples were typically those which reported

the highest concentrations Total PAH. Table 8.2 summarises the statistical evaluation of the Naphthalene sample population.

Table 8.2: Output of statistical evaluation of Naphthalene sample population

Chemical Constituent	HIL	No. Samples	Min. Conc.	Max. Conc.	Standard Deviation	Arithmetic Mean	95% UCL Conc.	Population Distribution
Naphthalene	3	33	<0.5	6.9	1.6	1.4	2.6	Non-parametric

The 95% UCL concentration of Naphthalene for the site is 2.6mg/kg which is below the HIL of 3mg/kg. The maximum reported concentration of Naphthalene of 6.9mg/kg is less than 250% of the HIL. The standard deviation for Naphthalene data is 1.6mg/kg which is slightly greater than 50% of the HIL. Given the above, and the likely source of naphthalene deriving from poorly combusted ash, it is assessed that naphthalene does not warrant further specific consideration with respect to vapour inhalation risks.

In summary, the presence of Lead and PAH compounds within shallow soils require further consideration during site redevelopment.

8.2.3 Terrestrial Ecosystems

In summary, the soil analytical results reported concentrations of COPC below the ecological assessment criteria for residential land uses with the exception of copper, lead, zinc, TRH >C16-C34 and benzo(a)pyrene. The elevated concentrations of copper, lead and zinc reported within shallow surface soils are likely to be associated with the weathering building materials (e.g. lead-based paints, coatings on roofing/guttering, utility piping etc.)

TRH C16-C34 and Benzo(a)pyrene were also reported at concentrations that exceeded the ecological assessment criteria. The source of this impact is likely to be associated with ash, as previously discussed in Section 8.2.2.

The presence of these constituents in shallow soils requires further consideration during site redevelopment.

8.2.4 Soil Aesthetics & Management Limits

Shallow fill materials were encountered that contained some quantities of anthropogenic materials. Materials such as glass, ceramic and porcelain, concrete and plastic have the potential to pose potential aesthetic issues. Given that these materials were not recorded in large quantities, it is assessed that these materials are unlikely to pose significant aesthetic issues, although further consideration of aesthetic issues should be made if such materials are retained on site and remain exposed as part of the site redevelopment.

With the exception of organic odours noted in BH1, BH3, TP06, no odorous and discoloured soils were observed. These odours were assessed not to pose unacceptable aesthetic issues when considering the natural state of the existing soil.

Concentrations of TPH in soil samples were recorded above the adopted management limits for TRHTRH >C16-C34 in shallow surface samples collected from BH3, HA3, TP4, TP5 and TP6 at approximate depth ranging between 0.1mbgs to 0.2mbgs. These sample locations generally appear to be located in close proximity to each other, in the central and eastern portion of the site. The management limits presented within NEPC (2013) were established to mitigate risks associated with:

(a) Formation of observable non-aqueous phase liquids

(b) Fire and explosive hazards, and

(c) Adverse effects on buried infrastructure (e.g. penetration of in-ground services)

As discussed above, it is assessed that the reported TRH C16-C34 concentrations are attributable to ash within shallow fill, rather than other hydrocarbon sources (e.g. oil, fuels etc.) that have the potential to form NAPL and/or pose fire hazards or risks to buried infrastructure. For this reason, the exceedance of the management limits does not require further consideration.

8.2.5 Preliminary Waste Classification

Laboratory results for soil indicate that the fill materials underlying the site classify as General Solid Waste in accordance with the waste classification procedure, when soil leachate analytical data (toxicity characteristics leaching procedure (TCLP)) is considered in accordance with Waste Classification Guidelines (NSW EPA, 2014). This assessment also considers the pre-classification of waste soils that derive from residential properties that are contaminated with lead paint waste.

Coffey recommends that the waste classification of fill materials be confirmed by observation of the appearance of fill materials during excavation works during construction. Should any unexpected contamination be discovered during excavation works, assessment of that material should include waste classification.

8.3 Groundwater Conditions

8.3.1 Groundwater Levels

Groundwater levels were recorded in all monitoring wells at the site on 6 February 2015. A summary of the groundwater levels recorded during this monitoring event are summarised in Table 8.3.

Table 8.3: Standing Groundwater Levels

Groundwater Monitoring Well	Top of Casing Relative Level (mAHD)	6 February 2015	
		Depth to Groundwater (mbTOC)[1]	Depth to Groundwater (m AHD)
BH1	38.0	3.21	34.79
BH4	33.0	4.17	28.83

Notes:
1. mbTOC = metres below Top of Casing.
2. The wells were reported to have purged dry during well gauging and development after well installation on 30 January 2015.
3. Relative levels for the bores installed as part of this investigation were based on interpolation from contour levels on the site plan.

With reference to the groundwater flow at the site, insufficient data is available to ascertain the flow direction. However based on the ground topography, groundwater within the fill and the underlying residual soils is likely to flow in an easterly direction.

8.3.2 Sampling Observations and Groundwater Chemistry

Observations and water quality parameters recorded during well development and sampling are provided in the field notes presented in Appendix F. It should be noted that poor well recovery in both the wells prevented water quality parameters to be measured in BH4 and after the wells purged dry (post-purge) in BH1. The water quality parameters reported are the parameters recorded prior to well BH1 purging dry. In summary, Coffey notes the following:

- Groundwater samples collected from each borehole was a brown colour and ranged from very cloudy to turbid, which was attributed to fine sediment suspended in solution. No evidence of NAPL or hydrocarbon sheens were detected in any of the wells gauged during this monitoring event.
- No odours were noted in monitoring wells BH1 and BH4.
- Dissolved oxygen (DO) within sample collected from BH1 was 2.89mg/L which is considered to be indicative of low level of oxygen in groundwater.
- Electrical conductivity (EC) within sample collected from BH1 was 589µS/cm which is considered to be indicative of freshwater conditions.
- Redox Potential of sample collected from BH1 was 340mV which is considered to be indicative of oxidising conditions.
- Groundwater pH was reported to be 5.0 which is indicative of slightly acidic conditions.
- The temperature of groundwater was reported to be 20.6°C.

As both BH1 and BH4 were found to have poor well recovery during development and purging, no water was recovered from BH4 and only a limited volume of water was recovered from BH1 after purging the well, restricting the suite of COPC able to be analysed.

8.3.3 Groundwater Quality

Groundwater analytical results from the monitoring event conducted on 6 February 2015 are presented in Table 8 in Appendix C. In summary, the concentration of all COPC was reported below the assessment criteria, with the exception of zinc. Coffey note that metals such as zinc are commonly encountered in urbanised environments, typical of the setting in Darlington. Coffey concludes that the reported impact to groundwater by zinc is diffuse and further assessment on the site for potential sources of this impact to groundwater is not warranted.

9 Conceptual Site Model

9.1 Sources of Contamination

The following sources of contamination have been identified from the investigation:

- Shallow fill material that contain lead and PAH compounds at concentrations that exceed the health assessment criteria
- Shallow fill material that contain copper, lead, zinc, TRH >C16-C34 and benzo(a)pyrene at concentrations which exceed the ecological assessment criteria.

9.2 Exposure Pathways

The key environmental pathways and exposure routes by which contaminants identified at the site may reach environmental and human receptors are assessed to include:

- Ingestion of soil
- Dermal contact with soil
- Inhalation of dusts and vapours
- Infiltration and leaching from unsaturated soils to shallow groundwater
- Vertical and lateral contaminant migration through the saturated zone
- Contaminant migration along preferential flow pathways (e.g. drainage systems, historic service conduits/corridors, building foundations etc.)
- Surface runoff / overland flow including storm water flowing along drainage at the site.
- Plant uptake
- Domestic consumption of groundwater.

9.3 Receptors

9.3.1 Ecological Receptors

The following ecological receptors are identified in relation to the site:

- Landscaping currently present within the site and adjoining the site
- Groundwater present as shallow lenses of perched water at the soil/rock interface, and deeper regional aquifer within fractures within the Bringelly Shale and Ashfield shale bedrock at depth.
- Off-site surface water bodies: Lake Northam located 800m north east of the site; Orphan School Creek and stormwater channel located approximately 1km north west of site; and Johnston's Creek located approximately 2km north west of site.

9.3.2 Human Receptors

The following current or future human receptors are identified:

- Current or future adult residential occupants within the site.
- Site visitors who attend site for short periods on an intermittent basis.

- Ground workers (site redevelopment and future maintenance events involving subsurface excavation works).
- Users of adjoining land, including construction workers and students within the university campus.
- Trespassers

9.4 Source – Pathway – Receptor Relationships

The following paragraphs discuss the plausible pollutant linkages between the contamination sources and receptors identified in relation to the site.

9.4.1 Human Health

Table 9.1 provides a summary of the plausible exposure pathways relevant to the human receptors identified above. The following symbols have been used within Table 9.1 to illustrate the completeness of the exposure pathway:

Table 9.1: Summary of plausible exposure pathways for human receptors

Receptor	Contaminated Media	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Inhalation & Ingestion	Dermal Contact	Domestic consumption of groundwater	Discussion of Potential Exposure Scenarios & Risks
Current and Future Residential Occupants On Site	Soil	n	n	**P**	**P**	n	Residents within the site may be exposed to contaminated fill materials via direct exposure routes (i.e. dermal contact, and inhalation/ingestion of soil) where fill material is exposed at surface. Exposure via direct exposure pathways is assessed to be currently limited due to the presence of hard ground surfacing (i.e. hardstand surfaces, concrete and brick paving etc.), although shallow fill is exposed in areas where soft cover materials are present across the site. This exposure is assessed to pose Moderate potential health risks. Given that the current structures are currently connected to town water supply, it is assessed that current site users would not abstract groundwater from the site for domestic consumption. Slightly elevated concentrations of naphthalene were reported in a small number of samples collected from shallow fill. Given that the source of naphthalene is assessed to derive from poorly combusted ash within shallow fill, it is considered that the presence of naphthalene poses a low-moderate to users of these buildings via the vapour inhalation pathway.
Site Visitors & Trespassers	Soil	n	n	**P**	**P**	n	Site visitors and Trespassers within the site have a similar exposure scenario to residents within the site, where the primary exposure pathways include inhalation/ingestion of soil and dermal contact, albeit the exposure duration and frequency would be significantly lower. It is considered unlikely that these receptors would be exposed to groundwater from the site.
Ground Workers (Future Maintenance Event)	Soil	n	n	**P**	**P**	n	Workers carrying out excavations within the site as part of the proposed development and a future maintenance event may be exposed to contaminated fill materials via inhalation/ingestion of soil, inhalation of vapours from soil/groundwater and dermal contact with soil and groundwater. This exposure scenario is assessed to pose Moderate potential health risks.

Receptor	Contaminated Media	Vapour Inhalation (Indoors)	Vapour Inhalation (Outdoors)	Inhalation & Ingestion	Dermal Contact	Domestic consumption of groundwater	Discussion of Potential Exposure Scenarios & Risks
Users of adjoining land	Soil	n	n	p	n	n	Users of adjoining land may be exposed to contamination within the site via the inhalation of dusts deriving from the site during a ground development and maintenance event. This pathway is considered partially complete however in consideration of the distance between the site and occupants of the surrounding land. This potential exposure scenario is assessed to pose a low potential health risks.

P = plausible complete pathways

p = partially complete pathway depending on site conditions/exposure scenario

n = pathway not complete

9.4.2 Ecological Receptors

Limited landscaping currently exists within the site, mostly within the rear (southern) parts of the terrace style buildings and around the boundaries of the site. Soil samples collected from the current investigation reported certain heavy metals, TPH and benzo(a)pyrene at concentrations which exceed ecological investigation levels. Existing landscaping is exposed to contaminated shallow fill via direct contact and associated plant uptake mechanisms. Observations made during the recent investigation did not identify significant vegetation die-back or stress. It remains unclear whether existing landscaping would be retained following site development.

Analysis of soil samples of shallow fill have reported concentrations of heavy metals, TPH and PAH compound. It is assessed that the shallow fill is unlikely to pose a significant risk to groundwater underlying the site for the following reasons:

- The likely source of heavy metal impacts relates to the weathering of building materials. Such materials are typically characterised as having low leachability. Limited data on groundwater quality beneath the site is generally supportive of this conclusion.
- The contamination impact was recorded in shallow soils (typically 0.0-0.2mbgs). Given that samples of deeper fill and residual soils reported concentrations of COPC at significantly lower concentrations, or below the LOR indicates the mobility of the shallow contamination is low.

Although poor recharge was noted within each groundwater monitoring well, the groundwater removed during sampling did not exhibit visible or olfactory evidence that significant groundwater contamination exists. Analysis of groundwater samples collected from BH1 did not report concentrations of COPC above the assessment criteria, with the exception of zinc. The source of zinc in groundwater was considered to be attributable to diffuse sources from the surrounding urban environment, rather than a specific source encountered within the site.

Based on the above, it is assessed that the potential risks to groundwater quality and surface water bodies located off site from ground conditions on site are low.

10 Conclusions & Recommendations

10.1 Summary of Site Setting & History

The site comprises a rectangular shaped plot of land adjoining Darlington Road, Darlington, within the University of Sydney campus. The site occupies a row of terrace style residential houses fronting Darlington Road, with small courtyard gardens to the rear of each property. Available records indicated that these terrace houses have occupied the site prior to the 1930s, and these properties have remained largely unchanged during that period. Surrounding areas of the site have undergone some change, primarily relating to the expansion of the university, and gradual modernisation of existing buildings.

10.2 Investigation Context & Summary of Key Findings

A programme of intrusive investigation was carried out across the site to further evaluate the significance of a number of Areas of Interest identified within a previous desk-based assessment prepared for the site (SKM, Sept 2014). In summary, the key findings of the investigation are as follows:

- Fill materials were encountered in all investigation locations established across the site to depths ranging between 0.1m (HA1-HA9) and >1.0m (BH1). Fill materials typically comprised a sandy Silt, sandy silty Gravel, silty to sandy Clay with variable quantities of anthropogenic materials noted in some locations. No significant visual or olfactory indications of contamination were noted during the investigation fieldworks. No materials suspected to contain asbestos were observed.
- The soil analytical results reported soil concentrations below the adopted health assessment thresholds, with the exception of lead and PAH compounds in samples of shallow soils collected from areas surrounding the building façade and rear gardens. The lead impacts are anticipated to derive from the weathering of lead-based paint. The PAH compounds were assessed to derive from ash for domestic fires. These soils have the potential to pose health risks to current and future site users via the dermal contact and inhalation/ingestion pathways, and hence require further consideration during site development.
- Analysis of samples of shallow soils collected from areas surrounding the building façade and rear gardens also reported concentrations of copper, zinc, TRH C16-C34 above the ecological investigation levels and hence are considered to pose a potential risk to ecological receptors and hence require further consideration during site redevelopment.
- The soils encountered during the investigation were assessed to classify as General Solid Waste (non-putrescible) according to the Waste Classification Guidelines (NSW EPA, 2014), on the basis that the lead impact recorded in soils likely derives weathered lead-based paint from a residential property.
- The groundwater analytical results reported groundwater concentrations below the adopted health assessment thresholds, with the exception of zinc. The source of zinc in groundwater was considered to be attributable to diffuse sources from the surrounding urban environment, rather than a specific source encountered within the site. As such, it is assessed that the potential risks to groundwater quality and surface water bodies located off site from ground conditions on site are low.

10.3 Conclusions & Recommendations

Based observations made during the investigation, it is assessed that the areas of interest located off site, including the University Garage, Recycling Centre, transformers and Joiners Shop, have not resulted in perceptible impacts to ground conditions within the site. Notwithstanding this, weathering of building materials and periodic deposition of ash from domestic fires has resulted in the concentration of heavy metals and PAH compounds in shallow fill in areas surrounding the terrace building façade and rear gardens. These soils have been assessed to pose health and ecological risks.

Based on the findings of the investigation, it is concluded that the site can be made suitable for the proposed development, subject to the implementation of works to mitigate the health and ecological risks identified. Based on the characteristics of the contamination impacts identified, a number of technically feasible options exist to mitigate the potential risks identified. These include:

- Retention of impacted fill materials beneath a suitable cover layer that restricts future site users being exposed to these soils. An Environmental Management Plan (EMP) would be required to document the location of where these soils are retained, and controls to maintain the cover layer over the longer term.
- Remove and dispose of shallow impacted fill materials to an appropriately licensed landfill facility.

It is recommended that the preferred management option is developed further and presented within a Remedial Action Plan (RAP), which is prepared in accordance with the Guidelines for Consultants Reporting on Contaminated Sites (NSW OEH, 2011) and the ASC NEPM (NEPC, 2013). It is recommended that a protocol to manage unexpected finds of contamination is also developed and presented within the RAP.

References

Friebel & Nadebaum (2011). *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater* (technical paper No.10) Guidelines, CRC for Contamination Assessment and Remediation of the Environment (CRC CARE)

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NEPC (1999) *National Environmental Protection (Assessment of Site Contamination)* Measure 1999, National Environment Protection Council.

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SKM (2010): Phase 1 Environmental Assessment for the 3.6Ha Abercrombie Precinct

Soil Conservation Service of NSW (1983); *Sydney Soil Landscape Series - Sheet 9130* (Scale: 1:100,000)

Standards Australia (2005). *Guide to the Sampling and Investigation of Potentially Contaminated Soil*. Part 1: Non-volatile and semi-volatile compounds, AS 4482.1-2005, Standards Australia, Homebush NSW.

Important information about your **Coffey** Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures

LEGEND

SITE BOUNDARY

20 0 20 40 60 80 100

Scale (metres) 1:2000

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.2
AERIAL IMAGE ©: SINCLAIR KNIGHT MERZ 2014

drawn	MV	coffey	client:	UNIVERSITY OF SYDNEY	
approved	ML		project:	ENVIROMENTAL SITE ASSESSMENT 00-02 DARLINGTON ROAD, DARLINGTON, NSW	
date	23/02/15		title:	SITE LOCATION PLAN	
scale	AS SHOWN		project no: GEOTLCOV25176AA-AD	figure no: FIGURE 1	rev: A
original size	A4				

PLOT DATE: 24/02/2015 3:17:36 PM DWG FILE: F:\GEOTECHNICS\1.PROJECTS\GEOTLCOV251\GEOTLCOV25176AA 00-02 DARLINGTON ROAD TERRACES\CAD\ENV\GEOTLCOV25176AA-AD.DWG

revision no.	description	drawn	approved	date
A	ORIGINAL ISSUE			

10 0 10 30 50

Scale (metres) 1:1000

drawn	MV
approved	ML
date	23/02/15
scale	AS SHOWN
original size	A3

coffey

client: UNIVERSITY OF SYDNEY

project: ENVIRONMENTAL SITE ASSESSMENT
00-02 DARLINGTON ROAD, DARLINGTON, NSW

title: INVESTIGATION LOCATION PLAN

project no: GEOTLCOV25176AA-AD | figure no: FIGURE 2 | rev: A

PLOT DATE: 25/02/2015 10:55:42 AM DWG FILE: F:\GEOTECHNICS\LPROJECTS\GEOTLCOV25\1GEOTLCOV25176AA 00-02 DARLINGTON ROAD TERRACES\CADENV\GEOTLCOV25176AA-AD.DWG

Appendix A – Investigation Logs

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Rock Description Explanation Sheet (1 of 2)

The descriptive terms used by Coffey are given below. They are broadly consistent with Australian Standard AS1726-1993.

DEFINITIONS: Rock substance, defect and mass are defined as follows:

Rock Substance	In engineering terms roch substance is any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Effectively homogenous material, may be isotropic or anisotropic.
Defect	Discontinuity or break in the continuity of a substance or substances.
Mass	Any body of material which is not effectively homogeneous. It can consist of two or more substances without defects, or one or more substances with one or more defects.

SUBSTANCE DESCRIPTIVE TERMS:

ROCK NAME	Simple rock names are used rather than precise geological classification.
PARTICLE SIZE	Grain size terms for sandstone are:
Coarse grained	Mainly 0.6mm to 2mm
Medium grained	Mainly 0.2mm to 0.6mm
Fine grained	Mainly 0.06mm (just visible) to 0.2mm
FABRIC	Terms for layering of penetrative fabric (eg. bedding, cleavage etc.) are:
Massive	No layering or penetrative fabric.
Indistinct	Layering or fabric just visible. Little effect on properties.
Distinct	Layering or fabric is easily visible. Rock breaks more easily parallel to layering of fabric.

CLASSIFICATION OF WEATHERING PRODUCTS

Term	Abbreviation	Definition
Residual Soil	**RS**	Soil derived from the weathering of rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.
Extremely Weathered Material	**XW**	Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or can be remoulded in water. Original rock fabric still visible.
Highly Weathered Rock	**HW**	Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of minerals in pores.
Moderately Weathered Rock	**MW**	The whole of the rock substance is discoloured, usually by iron staining or bleaching , to the extent that the colour of the fresh rock is no longer recognisable.
Slightly Weathered Rock	**SW**	Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by limonite) has taken place. The colour and texture of the fresh rock is recognisable; strength properties are essentially those of the fresh rock substance.
Fresh Rock	**FR**	Rock substance unaffected by weathering.

Notes on Weathering:

1. AS1726 suggests the term "Distinctly Weathered" (DW) to cover the range of substance weathering conditions between XW and SW. For projects where it is not practical to delineate between HW and MW or it is judged that there is no advantage in making such a distinction. DW may be used with the definition given in AS1726.
2. Where physical and chemical changes were caused by hot gasses and liquids associated with igneous rocks, the term "altered" may be substituted for "weathering" to give the abbreviations XA, HA, MA, SA and DA.

ROCK SUBSTANCE STRENGTH TERMS

Term	Abbrev-iation	Point Load Index, $I_{S}50$ (MPa)	Field Guide
Very Low	**VL**	Less than 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; pieces up to 30mm thick can be broken by finger pressure.
Low	**L**	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. Pieces of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	**M**	0.3 to 1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High	**H**	1 to 3	A piece of core 150mm long by 50mm can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High	**VH**	3 to 10	Hand specimen breaks after more than one blow of a pick; rock rings under hammer.
Extremely High	**EH**	More than 10	Specimen requires many blows with geological pick to break; rock rings under hammer.

Notes on Rock Substance Strength:

1. In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may break readily parallel to the planar anisotropy.
2. The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein makes it clear that materials in that strength range are soils in engineering terms.
3. The unconfined compressive strength for isotropic rocks (and anisotropic rocks which fall across the planar anisotropy) is typically 10 to 25 times the point load index (Is50). The ratio may vary for different rock types. Lower strength rocks often have lower ratios than higher strength rocks.

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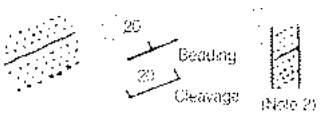
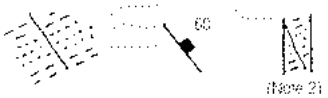
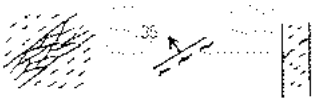
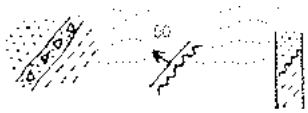
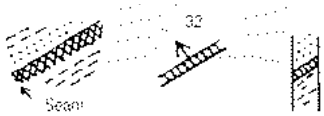
Rock Description Explanation Sheet (2 of 2)

COMMON DEFECTS IN ROCK MASSES

Term	Definition	Diagram	Map Symbol	Graphic Log (Note 1)
Parting	A surface or crack across which the rock has little or no tensile strength. Parallel or sub parallel to layering (eg bedding) or a planar anisotropy in the rock substance (eg, cleavage). May be open or closed.			
Joint	A surface or crack across which the rock has little or no tensile strength. but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance. May be open or closed.			
Sheared Zone (Note 3)	Zone of rock substance with roughly parallel near planar, curved or undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.			
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.			
Crushed Seam (Note 3)	Seam with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock substance which may be more weathered than the host rock. The seam has soil properties.			
Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as veneer or coating on joint surface.			
Extremely Weathered Seam	Seam of soil substance, often with gradational boundaries. Formad by weathering of the rock substance in place.			

DEFECT SHAPE TERMS

Planar	The defect does not vary in orientation
Curved	The defect has a gradual change in orientation
Undulating	The defect has a wavy surface
Stepped	The defect has one or more well defined steps
Irregular	The defect has many sharp changes of orientation

Note: The assessment of defect shape is partly influenced by the scale of the observation.

ROUGHNESS TERMS

Slickensided	Grooved or striated surface, usually polished
Polished	Shiny smooth surface
Smooth	Smooth to touch. Few or no surface irregularities
Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.

COATING TERMS

Clean	No visible coating
Stained	No visible coating but surfaces are discoloured
Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Coating	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (eg, infilled seam). Thicker rock strength material is usually described as a vein.

BLOCK SHAPE TERMS

Blocky	Approximately equidimensional
Tabular	Thickness much less than length or width
Columnar	Height much greate than cross section

Notes on Defects:

1. Usually borehole logs show the true dip of defects and face sketches and sections the apparent dip.
2. Partings and joints are not usually shown on the graphic log unless considered significant.
3. Sheared zones, sheared surfaces and crushed seams are faults in geological terms.

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Soil Description Explanation Sheet (1 of 2)

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 μm to 2.36 mm
	medium	200 μm to 600 μm
	fine	75 μm to 200 μm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH s_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material	Structure and fabric of parent rock visible.
Residual soil	Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil	Deposited by wind.
Alluvial soil	Deposited by streams and rivers.
Colluvial soil	Deposited on slopes (transported downslope by gravity).
Fill	Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Lacustrine soil	Deposited by lakes.
Marine soil	Deposited in ocean basins, bays, beaches and estuaries.

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Soil Description Explanation Sheet (2 of 2)

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)						USC	PRIMARY NAME
COARSE GRAIINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	(A 0.075 mm particle is about the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than 2.0 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.		GW	GRAVEL
				Predominantly one size or a range of sizes with more intermediate sizes missing.		GP	GRAVEL
			GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)		GM	SILTY GRAVEL
				Plastic fines (for identification procedures see CL below)		GC	CLAYEY GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.0 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes		SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	SAND
			SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).		SM	SILTY SAND
				Plastic fines (for identification procedures see CL below).		SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm			IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.				
		SILTS & CLAYS Liquid limit less than 50	**DRY STRENGTH**	**DILATANCY**	**TOUGHNESS**		
			None to Low	Quick to slow	None	ML	SILT
			Medium to High	None	Medium	CL	CLAY
			Low to medium	Slow to very slow	Low	OL	ORGANIC SILT
		SILTS & CLAYS Liquid limit greater than 50	Low to medium	Slow to very slow	Low to medium	MH	SILT
			High	None	High	CH	CLAY
			Medium to High	None	Low to medium	OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS			Readily identified by colour, odour, spongy feel and frequently by fibrous texture.			Pt	PEAT

• Low plasticity – Liquid Limit W_L less than 35%. • Medium plasticity – W_L between 35% and 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.	

TERM	DEFINITION	DIAGRAM
SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

coffey

Engineering Log - Borehole

Borehole ID.	***BH01***		
sheet:	1 of 1		
project no.	***GEOTLCOV25176AA***		
client:	***University of Sydney***	date started:	***28 Jan 2015***
principal:		date completed:	***28 Jan 2015***
project:	***00-02 Darlington Road Terraces***	logged by:	***SV***
location:	***00-02 Darlington Road, Darlington, NSW***	checked by:	***AH***

position: E: 332538; N: 6248336 (MGA94) surface elevation: 38.00 m (AHD) angle from horizontal: 90°

drill model: XC - Cross Country, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
HA			E E	38				**TOPSOIL: Sandy SILT**: low liquid limit, dark grey, fine to medium grained sand, trace rootlets, organic odour.	D - M			**TOPSOIL**
								FILL: Sandy SILT: low liquid limit, dark grey mottled pale white, medium to coarse grained sand.				**FILL** 0.2m: Photo Ionisation Detector (PID) = 5.5ppm 0.5m: PID = 0.0ppm
			E	37	1.0		CL	**FILL: CLAY**: low plasticity, pale brown, mottled orange-brown, trace of gravel, trace of sand, fine to medium grained, becoming pale brown.	M			**RESIDUAL SOIL** 1.0m: PID = 0.0ppm
AD/V			E SPT 4, 8, 12 N=20					**Silty CLAY**: medium plasticity, pale brown to orange-brown, mottled pale grey and red-brown, trace of ironstone gravel, sub-rounded.	D - M	St		1.5m: PID = 0.0ppm
				36	2.0							
			SPT 2, 10, 18 N=28	35	3.0			**SHALE**: pale brown to orange-brown, mottled pale grey and red-brown, extremely weathered, estimated very low strength, can be remoulded to silty clay. 3.5 m: estimated low strength				**WEATHERED BEDROCK** 3.5 m: V bit refusal
AD/T		06/02/15		34	4.0							
				33	5.0			Borehole BH01 terminated at 4.9 m Refusal				4.9 m: TC bit refusal
				32	6.0							
				31	7.0							

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- DT diatube
- HA hand auger

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
- M mud
- N nil
- C casing

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Engineering Log - Borehole

Borehole ID.	***BH02***
sheet:	1 of 1
project no.	***GEOTLCOV25176AA***
date started:	***27 Jan 2015***
date completed:	***27 Jan 2015***
logged by:	***SV***
checked by:	***AH***

client: ***University of Sydney***

principal:

project: ***00-02 Darlington Road Terraces***

location: ***00-02 Darlington Road, Darlington, NSW***

position: E: 332589; N: 6248355 (MGA94) surface elevation: 36.20 m (AHD) angle from horizontal: 90°

drill model: XC - Cross Country, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
HA		Not Encountered	E	36				**FILL: CONCRETE SLAB**: 60mm.	M			**CONCRETE SLAB**
								FILL: Silty CLAY: medium plasticity, orange-brown, grey.				**FILL** 0.2m: Photo Ionisation Detector (PID) = 0.5ppm
			E				CI	**Silty CLAY**: medium plasticity, pale grey to pale brown, trace subangular gravel.		F to St		**RESIDUAL SOIL** 0.5m: PID = 0.5ppm
			D + E	35	1.0							1.0m: PID = 0.9ppm
AD/V			E SPT 10, 15, 15 N=30									1.5m: PID = 2.2ppm
					2.0			**SHALE**: pale grey mottled red-brown, extremely weathered, estimated very low strength, can be remouolded to silty clay.				**WEATHERED BEDROCK**
AD/T				34				2.3 m: estimated low strength				2.3 m: V bit refusal
					3.0							
				33				Borehole BH02 terminated at 3.1 m Refusal				3.1 m: TC bit refusal
					4.0							
				32								
					5.0							
				31								
					6.0							
				30								
					7.0							
				29								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- DT diatube
- HA hand auger

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
- M mud
- N nil
- C casing

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Engineering Log - Borehole

Borehole ID.	***BH03***
sheet:	1 of 1
project no.	***GEOTLCOV25176AA***
date started:	***28 Jan 2015***
date completed:	***28 Jan 2015***
logged by:	***SV***
checked by:	***AH***

client: ***University of Sydney***

principal:

project: ***00-02 Darlington Road Terraces***

location: ***00-02 Darlington Road, Darlington, NSW***

position: E: 332630; N: 6248379 (MGA94) surface elevation: 35.50 m (AHD) angle from horizontal: 90°

drill model: XC - Cross Country, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
DT HA			D + E					**CONCRETE SLAB**: 90mm.	M			**CONCRETE SLAB**
			E	35				**FILL: Silty CLAY**: low plasticity, dark grey, with some gravel, angular to sub-angular, pale white and dark grey, trace sand, medium to coarse grained, presence of organic odour. 0.5 m: with cobble-sized brick fragments, red-brown, glass fragments, ceramic and Porcelain fragments (up to 70mm)	M to W			**FILL** 0.2m: Photo Ionisation Detector (PID) = 3.7ppm 0.5m: PID = 6.1ppm
			E		1.0		CL	**Silty CLAY**: medium plasticity, pale grey.				**RESIDUAL SOIL** 1.0m: PID = 5.3ppm
AD/V			E SPT 2, 5, 11 N=16	34				1.5 m: becoming pale grey, mottled orange-brown		St		1.5m: PID = 3.3ppm
				33	2.0							
			SPT 4, 12, 20 N=32	32	3.0			**SHALE**: pale grey, mottled red-brown, extremely weathered, estimated very low strength, can be remoulded to silty clay.				**WEATHERED BEDROCK**
AD/T					4.0			3.8 m: estimated low strength				3.8 m: V bit refusal
			SPT 25 N=R	31								4.58 m: TC bit refusal
					5.0			Borehole BH03 terminated at 4.58 m Refusal				
				30								
					6.0							
				29								
					7.0							
				28								

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- DT diatube
- HA hand auger

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
- M mud
- N nil
- C casing

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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Engineering Log - Borehole

Borehole ID.	**BH04**
sheet:	1 of 1
project no.	**GEOTLCOV25176AA**
date started:	**27 Jan 2015**
date completed:	**28 Jan 2015**
logged by:	**SV**
checked by:	**AH**

client: ***University of Sydney***

principal:

project: ***00-02 Darlington Road Terraces***

location: ***00-02 Darlington Road, Darlington, NSW***

position: E: 332679; N: 332679 (MGA94) surface elevation: 33.00 m (AHD) angle from horizontal: 90°

drill model: XC - Cross Country, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
HA			E	33				**CONCRETE SLAB**: 60mm.	M to W			**CONCRETE SLAB**
			D + E					**FILL: CLAY**: high plasticity, dark grey, trace of gravel, angular, fine grained, pale white.				**FILL** 0.2m: Photo Ionisation Detector (PID) = 10.5ppm 0.5m: PID = 2.1ppm
			E	32	1.0		CL	**Silty CLAY**: medium plasticity, pale brown to orange red-brown.	D	VSt		**RESIDUAL SOIL** 1.0m: PID = 3.1ppm
AD/V			E SPT 2, 4, 7 N=11	31	2.0			1.5 m: becoming pale grey, with red-brown iron staining				1.5m: PID = 0.5ppm
			SPT 7, 16, 19 N=35	30	3.0			**SHALE**: pale grey mottled red-brown, extremely weathered, estimated very low strength, can be remoulded to silty clay.				**WEATHERED BEDROCK**
		06/02/15		29	4.0							
AD/T				28	5.0			4.4 m: estimated low strength 4.5 m: becoming dark grey				4.4 m: V bit refusal
								Borehole BH04 terminated at 5.10 m Refusal				5.1 m: TC bit refusal
				27	6.0							
				26	7.0							

method

AD	auger drilling*
AS	auger screwing*
HA	hand auger
W	washbore
DT	diatube
HA	hand auger
*	bit shown by suffix
e.g.	AD/T
B	blank bit
T	TC bit
V	V bit

support

M	mud
C	casing
N	nil

penetration

1 2 3 — no resistance ranging to refusal

water

10-Oct-12 water level on date shown

water inflow

water outflow

samples & field tests

B	bulk disturbed sample
D	disturbed sample
E	environmental sample
SS	split spoon sample
U##	undisturbed sample ##mm diameter
HP	hand penetrometer (kPa)
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
VS	vane shear; peak/remouded (kPa)
R	refusal
HB	hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
Wl	liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

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Piezometer Installation Log

Hole ID.	***BH01***
sheet:	1 of 1
project no.	***GEOTLCOV25176AA***
date started:	***28 Jan 2015***
date completed:	***28 Jan 2015***
logged by:	***SV***
checked by:	***AH***

client: ***University of Sydney***

principal:

project: ***00-02 Darlington Road Terraces***

location: ***00-02 Darlington Road, Darlington, NSW***

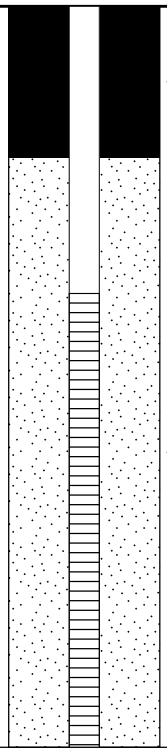
position: E: 332538; N: 6248336 (MGA94) surface elevation: 38.00 m (AHD) angle from horizontal: 90°

equipment type: XC - Cross Country, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

bore construction license:
drilling company:
driller:
driller's permit no.:

method & support	water	RL (m)	depth (m)	material name
HA		38		TOPSOIL: Sandy SILT
				FILL: Sandy SILT
				FILL: CLAY
		37	1	Silty CLAY
ADV		36	2	
		35	3	SHALE
AD/T	06/02/15	34	4	
		33	5	Borehole BH01 terminated at 4.90 m Refusal
		32	6	
		31	7	



method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH01	standpipe piezo.		4.90 m 33.10 m AHD		

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Piezometer Installation Log

Hole ID.	***BH04***
sheet:	1 of 1
project no.	***GEOTLCOV25176AA***
date started:	***27 Jan 2015***
date completed:	***28 Jan 2015***
logged by:	***SV***
checked by:	***AH***

client: ***University of Sydney***

principal:

project: ***00-02 Darlington Road Terraces***

location: ***00-02 Darlington Road, Darlington, NSW***

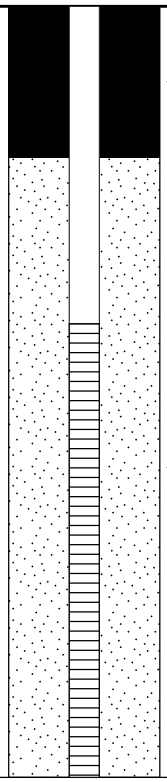
position: E: 332679; N: 332679 (MGA94) surface elevation: 33.00 m (AHD) angle from horizontal: 90°

equipment type: XC - Cross Country, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

bore construction license:
drilling company:
driller:
driller's permit no.:

method & support	water	RL (m)	depth (m)	material name
		33		CONCRETE SLAB
HA				FILL: CLAY
		32	1	Silty CLAY
		31	2	
AD/V		30	3	SHALE
	06/02/15	29	4	
AD/T		28	5	
		27	6	Borehole BH04 terminated at 5.10 m Refusal
		26	7	



Bentonite

Sand

method & support
see engineering log for details

water
10-Oct-12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
1	standpipe		5.10 m 27.90 m AHD	30/01/2015	

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Engineering Log - Excavation

Excavation ID.	***TP01***		
sheet:	1 of 1		
project no.	***GEOTLCOV25176AA***		
client:	***University of Sydney***	date excavated:	***29 Jan 2015***
principal:		date completed:	***29 Jan 2015***
project:	***00-02 Darlington Road Terraces***	logged by:	***SV***
location:	***00-02 Darlington Road, Darlington, NSW***	checked by:	***AH***

position: E: 332545; N: 6248351 (MGA94) surface elevation: 38.80 m (AHD) pit orientation: 310° DCP id.:

equipment type: Concrete Cutter/Shovel excavation method: Hand Excavation and Hand Auger excavation dimensions: 0.9 m long 0.8 m wide

excavation information | **material substance**

method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
	N		Not Observed						**CONCRETE SLAB**: 50mm.	D				**CONCRETE SLAB**
									FILL: BRICK PAVERS					**FILL**
				E					**FILL: Sandy CLAY**: low plasticity, pale brown to dark brown, sand is medium to coarse grained, trace limestone gravel, angular, pale white, some broken porcelain pots.					0.2m: Photo Ionisation Detector (PID) = 0.0ppm
					38.5									
						0.5								
				E										0.6m: PID = 0.0ppm
HA								CL	**Silty CLAY**: medium to high plasticity, dark brown to dark grey.		St			**RESIDUAL SOIL**
					38.0				Test pit TP01 terminated at 0.78 m Target depth					
						1.0								
					37.5									
						1.5								
					37.0									

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- N none
- S shoring

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- U## undisturbed sample ##mm diameter
- D disturbed sample
- B bulk disturbed sample
- E environmental sample
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shearpeak/remouded (uncorrected kPa)
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- W_P plastic limit
- W_L liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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TP1 (1 of 2)

TP1 (2 of 2)

drawn	SV	coffey	client:	University of Sydney
approved	JJM		project:	00-02 Darlington Road Terraces 00-02 Darlington Road, Darlington, NSW
date	24-Feb-15			
scale	NTS		title:	Test Pit Photographs - TP1
original size	A4		project no: GEOTLCOV25176AA	figure no: FIGURE 1

coffey

Engineering Log - Excavation

client:	***University of Sydney***	Excavation ID.	***TP02***
principal:		sheet:	1 of 1
project:	***00-02 Darlington Road Terraces***	project no.	***GEOTLCOV25176AA***
location:	***00-02 Darlington Road, Darlington, NSW***	date excavated:	***29 Jan 2015***
		date completed:	***29 Jan 2015***
		logged by:	***SV***
		checked by:	***AH***

position: E: 332552; N: 6248355 (MGA94) surface elevation: 38.50 m (AHD) pit orientation: 310° DCP id.:

equipment type: Concrete Cutter/Shovel excavation method: Hand Excavation and Hand Auger excavation dimensions: 0.7 m long 0.5 m wide

excavation information | **material substance**

method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
	N		Not Observed		38.5				**CONCRETE SLAB**: 50mm.	D				**CONCRETE SLAB**
									FILL: SAND: coarse grained, pale green to pale grey, trace ironstone gravel, angular, dark grey.					**FILL**
				E					**FILL: Silty GRAVEL**: fine to coarse grained, angular, pale brown, with some cobble sized brick fragments, with some tree roots.					0.2m: Photo Ionisation Detector (PID) = 16.2ppm
				E					**FILL: Silty CLAY**: medium plasticity, dark grey, mottled orange-brown, trace brick fragments.	D to M				0.4m: PID = 0.0ppm
					38.0	0.5		CL	**Silty CLAY**: medium plasticity, orange-brown, mottled pale grey.	M	S to F			**RESIDUAL SOIL**
HA					37.5	1.0								
				D					Test pit TP02 terminated at 1.2 m Target depth					
					37.0	1.5								

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method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- N none
- S shoring

penetration
1 2 3
- no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- U## undisturbed sample ##mm diameter
- D disturbed sample
- B bulk disturbed sample
- E environmental sample
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shearpeak/remouded (uncorrected kPa)
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- W_P plastic limit
- W_L liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

TP02 (1 of 2)

TP02 (2 of 2)

drawn	SV	coffey	client:	University of Sydney
approved	JJM		project:	00-02 Darlington Road Terraces 00-02 Darlington Road, Darlington, NSW
date	24-Feb-15			
scale	NTS		title:	Test Pit Photographs - TP2
original size	A4		project no: GEOTLCOV25176AA	figure no: FIGURE 2

coffey

Engineering Log - Excavation

client:	***University of Sydney***	Excavation ID.	***TP03***
principal:		sheet:	1 of 1
project:	***00-02 Darlington Road Terraces***	project no.	***GEOTLCOV25176AA***
location:	***00-02 Darlington Road, Darlington, NSW***	date excavated:	***29 Jan 2015***
		date completed:	***29 Jan 2015***
		logged by:	***SV***
		checked by:	***AH***

position: E: 332598; N: 6248375 (MGA94) surface elevation: 37.70 m (AHD) pit orientation: 310° DCP id.:

equipment type: Concrete Cutter/Shovel excavation method: Hand Excavation and Hand Auger excavation dimensions: 0.8 m long 0.8 m wide

excavation information | **material substance**

method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
	N								**CONCRETE SLAB**: 100mm.	D				**CONCRETE SLAB**
			Not Observed	E	37.5	0.5			**FILL: Silty GRAVEL**: fine to coarse grained, sub-angular to angular, with some brick and porcelain fragments, with some tree roots.					**FILL** 0.35m: Photo Ionisation Detector (PID) = 0.0ppm
				D E	37.0				**FILL: CLAY**: medium plasticity, dark grey, with some pale white sub-rounded to sub-angular gravel, trace of brick fragments.					0.6m: PID = 0.0ppm
HA								CL	**Silty CLAY**: medium plasticity, dark grey to dark brown.		St			**RESIDUAL SOIL**
					36.5	1.0 1.5			Test pit TP03 terminated at 0.92 m Target depth					
					36.0									

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- N none
- S shoring

penetration
1 2 3
no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- U## undisturbed sample ##mm diameter
- D disturbed sample
- B bulk disturbed sample
- E environmental sample
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shearpeak/remouded (uncorrected kPa)
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- W_P plastic limit
- W_L liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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TP03 (1 of 2)

TP03 (2 of 2)

drawn	SV	coffey	client: University of Sydney	
approved	JJM		project: 00-02 Darlington Road Terraces 00-02 Darlington Road, Darlington, NSW	
date	24-Feb-15			
scale	NTS		title: Test Pit Photographs - TP3	
original size	A4		project no: GEOTLCOV25176AA	figure no: FIGURE 3

coffey

Engineering Log - Excavation

Excavation ID.	***TP04***		
sheet:	1 of 1		
project no.	***GEOTLCOV25176AA***		
client:	***University of Sydney***	date excavated:	***29 Jan 2015***
principal:		date completed:	***29 Jan 2015***
project:	***00-02 Darlington Road Terraces***	logged by:	***SV***
location:	***00-02 Darlington Road, Darlington, NSW***	checked by:	***AH***

position: E: 332621; N: 6248385 (MGA94) surface elevation: 36.50 m (AHD) pit orientation: 310° DCP id.:

equipment type: Shovel excavation method: Hand Excavation and Hand Auger excavation dimensions: 0.9 m long 0.6 m wide

excavation information | **material substance**

method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
	N				36.5				**BRICK PAVERS**: 80mm.	M				**BRICK PAVERS**
				E					**FILL: SAND**: coarse grained, pale green-brown.					**FILL** 0.2m: Photo Ionisation Detector (PID) = 0.0ppm
			Not Observed	E					**FILL: Silty GRAVEL**: fine to coarse grained, sub-angular to angular, pale grey to dark brown, trace of medium plasticity clay, dark grey, with some brick fragments, trace ironstone gravel.	D				0.4m: PID = 0.0ppm
					36.0	0.5								
								CL	**Silty CLAY**: medium plasticity, dark brown to dark grey.	M	F to St			**RESIDUAL SOIL**
HA				D										
					35.5	1.0								
									Test pit TP04 terminated at 1.05 m Target depth					
					35.0	1.5								

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- N none
- S shoring

penetration
1 2 3
- no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- U## undisturbed sample ##mm diameter
- D disturbed sample
- B bulk disturbed sample
- E environmental sample
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shearpeak/remouded (uncorrected kPa)
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- W_P plastic limit
- W_L liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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TP04 (1 of 2)

TP04 (2 of 2)

drawn	SV	coffey	client:	University of Sydney
approved	JJM		project:	00-02 Darlington Road Terraces 00-02 Darlington Road, Darlington, NSW
date	24-Feb-15			
scale	NTS		title:	Test Pit Photographs - TP4
original size	A4		project no: GEOTLCOV25176AA	figure no: FIGURE 4

coffey

Engineering Log - Excavation

Excavation ID.	***TP05***		
sheet:	1 of 1		
project no.	***GEOTLCOV25176AA***		
client:	***University of Sydney***	date excavated:	***29 Jan 2015***
principal:		date completed:	***29 Jan 2015***
project:	***00-02 Darlington Road Terraces***	logged by:	***SV***
location:	***00-02 Darlington Road, Darlington, NSW***	checked by:	***AH***

position: E: 332644; N: 6248395 (MGA94) surface elevation: 35.30 m (AHD) pit orientation: 310° DCP id.:

equipment type: Concrete Cutter/Shovel excavation method: Hand Excavation and Hand Auger excavation dimensions: 0.7 m long 0.8 m wide

excavation information | **material substance**

method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
	N								**CONCRETE SLAB**: 100mm.	D				**CONCRETE SLAB**
			Not Observed	E E	35.0	0.5			**FILL: Silty GRAVEL**: fine to coarse grained, angular, pale brown to orange brown, with some coarse grained sand, trace low to medium plasticity clay, trace of brick fragments, trace of cobbles of limestone.					**FILL** 0.2m: Photo Ionisation Detector (PID) = 0.0ppm 0.4m: PID = 0.0ppm
HA					34.5			CL	**Silty CLAY**: medium plasticity, dark grey to dark brown.	D to M	St			**RESIDUAL SOIL**
					34.0 33.5	1.0 1.5			Test pit TP05 terminated at 0.9 m Target depth					

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- N none
- S shoring

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- U## undisturbed sample ##mm diameter
- D disturbed sample
- B bulk disturbed sample
- E environmental sample
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shearpeak/remouded (uncorrected kPa)
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- W_P plastic limit
- W_L liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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TP05 (1 of 2)

TP05 (2 of 2)

drawn	SV	coffey	client: University of Sydney	
approved	JJM		project: 00-02 Darlington Road Terraces 00-02 Darlington Road, Darlington, NSW	
date	24-Feb-15			
scale	NTS		title: Test Pit Photographs - TP5	
original size	A4		project no: GEOTLCOV25176AA	figure no: FIGURE 5

coffey

Engineering Log - Excavation

client:	***University of Sydney***	Excavation ID.	***TP06***
principal:		sheet:	1 of 1
project:	***00-02 Darlington Road Terraces***	project no.	***GEOTLCOV25176AA***
location:	***00-02 Darlington Road, Darlington, NSW***	date excavated:	***29 Jan 2015***
		date completed:	***29 Jan 2015***
		logged by:	***SV***
		checked by:	***AH***

position: E: 332679; N: 6248410 (MGA94) surface elevation: 33.10 m (AHD) pit orientation: 310° DCP id.:

equipment type: Concrete Cutter/Shovel excavation method: Hand Excavation and Hand Auger excavation dimensions: 0.6 m long 0.8 m wide

excavation information | **material substance**

method	support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
HA	N		Not Observed						**CONCRETE SLAB**: 100mm.	D				**CONCRETE SLAB**
					33.0				**FILL: GRAVEL**					**FILL**
				E					**FILL: Silty GRAVEL**: fine to coarse grained, angular, pale brown to dark brown, gravel is composed of concrete fragments, with some brick fragments, with some cobbles of concrete.					0.2m: Photo Ionisation Detector (PID) = 0.0ppm
				E					**FILL: Gravelly CLAY**: medium plasticity, pale white, gravel is angular to sub-angular, presence of organic odour.					0.4m: PID = 0.0ppm
						0.5		CL	**Silty CLAY**: medium plasticity, pale brown to brown.	D to M	F to St			**RESIDUAL SOIL**
					32.5									
				D										
						1.0			Test pit TP06 terminated at 0.8 m Target depth					
					32.0									
						1.5								
					31.5									

method
- N natural exposure
- X existing excavation
- BH backhoe bucket
- B bulldozer blade
- R ripper
- E excavator

support
- N none
- S shoring

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- U## undisturbed sample ##mm diameter
- D disturbed sample
- B bulk disturbed sample
- E environmental sample
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shearpeak/remouded (uncorrected kPa)
- R refusal

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- W_P plastic limit
- W_L liquid limit

consistency / relative density
- VS very soft
- S soft
- F firm
- St stiff
- VSt very stiff
- H hard
- Fb friable
- VL very loose
- L loose
- MD medium dense
- D dense
- VD very dense

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TP06 (1 of 2)

TP06 (2 of 2)

drawn	SV	coffey	client:	University of Sydney
approved	JJM		project:	00-02 Darlington Road Terraces 00-02 Darlington Road, Darlington, NSW
date	24-Feb-15			
scale	NTS		title:	Test Pit Photographs - TP6
original size	A4		project no: GEOTLCOV25176AA	figure no: FIGURE 6

Engineering Log - Excavation

Excavation No.	***HA1***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Mulch with layer of plastic.	D			No odour/staining. No observed asbestos containing material.
				1.4ppm					**FILL**:**Sandy SILT**: fine to medium grained, dark brown.	M			
									Test pit HA1 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA2***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Mulch layer.	M			No odour/staining. No observed asbestos containing material.
				6.2ppm					**FILL**:**Sandy SILT**: fine to medium grained, dark brown.	D			
									Test pit HA2 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA3***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Leaf Litter.	M			No odour/staining. No observed asbestos containing material.
				3.1ppm					**FILL**:**Gravelly SAND**: fine to medium grained, dark brown, with some large gravels <60mm.	D			
									Test pit HA3 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA4***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Mulch layer with leaf litter.	M			No odour/staining. No observed asbestos containing material.
				2.5ppm					**FILL**:**Sandy SILT**: fine to medium grained, dark brown, with some small gravels <10mm.	M			
									Test pit HA4 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA5***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Thick grass coverage	M			No odour/staining. No observed asbestos containing material.
				7.0ppm					**FILL**:**Sandy SILT**: fine to medium grained, dark brown, with some small gravels <5mm.	M			
									Test pit HA5 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA6***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Mulch layer with leaf litter.	M			No odour/staining. No observed asbestos containing material.
				3.2ppm					**FILL**:**Gravelly SAND**: fine to coarse grained, light brown/orange, with some large gravels <25mm.	D			
									Test pit HA6 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA7***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Thick grass coverage	M			No odour/staining. No observed asbestos containing material.
				2.5ppm					**FILL**:**Sandy SILT**: fine to medium grained, dark brown, with some small gravels <40mm.	M			
									Test pit HA7 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA8***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Mulch layer with leaf litter.	M			No odour/staining. No observed asbestos containing material.
				2.7ppm					**FILL**:**Sandy SILT**: fine to medium grained, dark brown, with some small gravels <10mm.	D			
									Test pit HA8 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Excavation

Excavation No.	***HA9***		
Sheet	1 of 1		
Office Job No.:	***GEOTLCOV25176AA***		
Client:	***University of Sydney***	Date started:	***28.1.2015***
Principal:		Date completed:	***28.1.2015***
Project:	***Darlington Road Terraces, Darlington***	Logged by:	***MB***
Test pit location:	***Darlington Lane, Darlington***	Checked by:	***PD***

equipment type and model: Hand Auger | Pit Orientation: | Easting: m | R.L. Surface:

excavation dimensions: 0.1m long 0.1m wide | Northing: m | datum: AHD

excavation information							material substance							
method	penetration 1 2 3	water	PID	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA									**FILL**: Mulch layer with leaf litter.	M			No odour/staining. No observed asbestos containing material.
				2.2ppm					**FILL**:**Gravelly SAND**: fine to coarse grained, light brown, with some large gravels <10mm.	D			
									Test pit HA9 terminated at 0.1m				
						0.5							

method

DT	diatube
PT	push tube
SS	soild stem flight auger
HS	hollow stem flight auger
VT	V Bit, T Bit
AH	air hammer
CP	cable percussive
HA	hand auger
NDD	non-destructive digging
RC	rock corer

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
V	vane shear (kPa)
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Appendix B – Data Validation Assessment

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25176AA

Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

I. SAMPLE HANDLING

	Yes	**No** (Comment below)
1. Were the sample **holding times** met?	☒	☐
2. Were the samples in **proper custody** between the field and reaching the laboratory?	☒	☐
3. Were the samples **properly and adequately** preserved? *This includes keeping the samples chilled, where applicable.*	☒	☐
4. Were the samples received by the laboratory in good condition?	☒	☐

COMMENTS:

Coffey note that all samples were received by the laboratory to enable analysis to be undertaken within appropriate holding times.

Sample Handling was: ☒ Satisfactory ☐ Partially Satisfactory ☐ Unsatisfactory

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25176AA

Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

II PRECISION/ACCURACY ASSESSMENT

	Yes	No (Comment below)
1. Was a NATA registered laboratory used?	☒	☐
2. Did the laboratory perform the requested tests?	☒	☐
3. Were the laboratory methods adopted NATA endorsed?	☒	☐
4. Were the appropriate test procedures followed?	☒	☐
5. Were the reporting limits satisfactory?	☒	☐
6. Was the NATA Seal on the reports?	☒	☐
7. Were the reports signed by an authorised person?	☒	☐

COMMENTS:

Precision/Accuracy of the Laboratory Report	☒ Satisfactory ☐ Partially Satisfactory	☐ Unsatisfactory

Coffey Environments Australia Pty Ltd

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DATA VALIDATION REPORT

Job No: GEOTLCOV25176AA

Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

III. FIELD QA/QC

1. Number of Samples Analysed — Soil 31; Groundwater 1

2. Number of Days of Sampling: 4

3. Number and Type of QA/QC Samples Collected:

Quality Control Sample Type	No.	% Total No. Samples
Intra-lab Duplicates (Soil)	2	7%
Inter-lab Duplicates (Soil)	1	3%
Intra-lab Duplicates (Groundwater)	-	-
Inter-lab Duplicates (Groundwater)	-	-
Trip Blanks	2	-
Trip Spike	2	-
Equipment Rinsate	2	-

4. FIELD DUPLICATES

	Yes	**No** (Comment below)
A. Were an Adequate Number of field duplicates analysed for each chemical?	☐	☒
B. Were RPDs within Control Limits?		
a. Organics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☐	☒
b. Metals/Inorganics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☐	☒
c. Volatile & semi volatile organics (No limit (<10 x LOR); 50% (10-20 x LOR); 30% (>20 x LOR))	☒	☐

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Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

COMMENTS:

- The analysis of inter-lab duplicate samples were slightly lower than the 5% rate specified within AS4482.1 (2005) for soil samples. The number of intra-lab duplicates exceeded this target however.
- No intra-lab or inter-lab duplicate samples were collected for groundwater due to insufficient sample recovery.
- The RPDs for Organics and Metals/Inorganics were not reported within Control Limits for some samples likely due to variability in soil material and the heterogeneous distribution of these chemicals within soils on site.

Coffey Environments Australia Pty Ltd

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DATA VALIDATION REPORT

Job No: GEOTLCOV25176AA

Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

IV. TRIP BLANKS (TB) AND TRIP SPIKES (TS)

	Yes	No (Comment below)
A. Were an Adequate Number of trip blanks and spikes analysed?	☒	☐
B. Were the trip blanks free of contaminants?	☒	☐
C. Were the trip spikes reported within acceptable recoveries?	☐	☒

COMMENTS:

- The recovery for the trip spike collected during the soil sampling on 28 January 2015 was reported slightly below the lower recovery limit of 70%. This indicates that some loss of volatiles may have occurred during the sampling event and transportation of these samples to/from site. However, concentrations volatile analytes were reported below LOR in soil samples collected on that day, therefore the slight loss of volatiles from the trip spike is considered unlikely to affect the quality of the data assessed.

6. EQUIPMENT RINSATE SAMPLES

	Yes	No (Comment below)
A. Were an adequate number of Equipment Rinsate Samples collected?	☒	☐
B. Were the Equipment Rinsate Samples free of contaminants?	☒	☐

Field QA/QC was:	☒ Satisfactory ☐ Partially Satisfactory	☐ Unsatisfactory

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25176AA

Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

V LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

1. Type of QA/QC Samples

	Yes	No
Laboratory Blanks/Reagent Blanks	☒	☐
Laboratory Duplicates	☒	☐
Matrix Spikes/Matrix Spike Duplicates	☒	☐
Laboratory Control Spike	☒	☐
Surrogate (where appropriate)*	☒	☐

	Yes	**No** (Comment below)
2 Were the laboratory blanks/reagents blanks free of contamination?	☒	☐
3. Were the spike recoveries within control limits?		
a. Organics (70% to 130%)	☒	☐
b. Metals/Inorganic (70% to 130%)	☒	☐
4. Were the RPDs of the laboratory duplicates within control limits?	☐	☒
5. Were the surrogate recoveries within control limits?	☒	☐

COMMENTS:

- The RPD for naphthalene was reported slightly above the initial acceptance limit in lab report 446121. However, on considering further, Eurofins MGT reported that this RPD was considered acceptable.

5. The laboratory internal QA/QC was:	☒ Satisfactory	☐ Unsatisfactory
	☐ Partially Satisfactory	

Coffey Environments Australia Pty Ltd

A.B.N. 65 140 765 902

DATA VALIDATION REPORT

Job No: GEOTLCOV25176AA

Soil Analysis - Lab Batch References: 445748, 445754, 446121, 446881 and ES1502250

Groundwater Analysis – Lab Batch Reference: 446746

VI DATA USABILITY

1. Data Directly Usable ☒
2. Data Usable with the following considerations ☐
3. Data Not Usable. ☐

COMMENTS:

Appendix C – Laboratory Analytical Data: Summary Tables

Table 1:
Soil Analytical Data Compared to Health Criteria for a High Density Residential Land Use (HIL/HSL B)
Univeristy of Sydney
Darlington Terraces

					Field ID	BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5	BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5	BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5	BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5	HA1	QC1	HA2	HA3	HA4	HA5	QC2	HA6	HA7	HA8	HA9	TP1_0.2	TP2_0.2	TP3_0.35	TP4_0.2	TP5_0.2	TP6_0.2
					Sample Date	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015
					Matrix_Description	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Method_Type	Analyte	Units	LOR	NEPM 2013 HILs Residential B Soil																																		
Heavy Metal	Arsenic	mg/kg	2	500		28	7.9	5.7	6.4	4.8	4.5	6.1	<2	19	5.1	5.9	3.9	5.7	7.6	42	11	9.3	8.6	7	9.8	12	13	12	4.7	4.9	5.1	16	5.1	2.4	2.9	3.6	5	16
	Cadmium	mg/kg	0.4	150		2.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1	<0.4	<0.4	<0.4	1.1	<0.4	<0.4	<0.4	0.8	0.7	0.5	1.2	1.5	3.1	1.8	<0.4	0.5	0.6	1.6	3.1	<0.4	0.5	0.7	1	<0.4
	Chromium	mg/kg	5	500		25	28	16	13	21	10	6.4	<5	26	15	7.8	6	25	25	15	9.4	72	19	9.2	29	28	31	23	18	11	35	21	15	6.8	<5	11	9	12
	Copper	mg/kg	5	30000		110	<5	5.9	11	7	5.5	9.4	12	260	80	13	14	150	14	7.2	16	120	120	30	230	230	270	160	29	34	81	160	14	9.6	19	40	40	66
	Lead	mg/kg	5	1200		1300	21	25	18	36	18	17	17	2500	540	68	43	1500	55	29	31	4200	2700	260	4300	2100	3700	1700	330	310	540	1400	250	120	620	1200	3400	1600
	Mercury	mg/kg	0.05	120		0.58	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.49	0.39	<0.05	<0.05	0.27	0.05	<0.05	<0.05	1.2	0.73	0.13	0.8	1.3	0.67	0.45	0.22	0.29	0.19	0.76	0.12	0.27	0.92	0.21	0.67	0.76
	Nickel	mg/kg	5	1200		12	<5	<5	<5	<5	<5	<5	<5	19	5.3	<5	<5	11	<5	<5	<5	8	7.8	<5	12	15	16	15	9.9	7	19	12	<5	<5	5.5	6.4	<5	23
	Zinc	mg/kg	5	60000		1200	6.6	15	7.2	63	14	<5	<5	1100	510	21	10	680	320	15	9.3	810	680	250	1300	950	1400	1300	400	590	630	930	630	72	800	390	1000	400
OCP	4,4-DDE	mg/kg	0.05			0.17	-	-	-	<0.05	-	-	-	0.19	-	-	-	0.16	-	-	-	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	-	-	-	-	-	-
	a-BHC	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Aldrin	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	b-BHC	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Chlordane	mg/kg	0.1	90		<0.1	-	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	-	-	-	-	-	-
	d-BHC	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	DDD	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.073	<0.065	<0.05	<0.05	<0.072	<0.05	<0.22	<0.05	<0.05	<0.05	<0.14	-	-	-	-	-	-
	DDT	mg/kg	0.05			0.27	-	-	-	<0.05	-	-	-	0.62	-	-	-	0.24	-	-	-	0.22	0.13	<0.05	0.21	<0.12	<0.66	0.15	<0.094	<0.05	<0.05	0.32	-	-	-	-	-	-
	DDT+DDE+DDD	mg/kg	-	600		0.49	-	-	-	-	-	-	-	0.86	-	-	-	0.45	-	-	-	0.34	0.31	-	0.31	-	-	0.42	-	-	-	0.69	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	-	-	-	-	-	-
	Aldrin + Dieldrin	mg/kg		10		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	0.24	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05	400		<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05	400		<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.13	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endrin	mg/kg	0.05	20		<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05	10		<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05	15		<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2	500		<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-
	Toxaphene	mg/kg	1	30		<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
OPP	Azinophos methyl	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.5	340		<1	-	-	-	<0.5	-	-	-	<1.6	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.7	<1.7	<1.1	<1.8	<0.5	<0.6	<1.3	-	-	-	-	-	-
	Coumaphos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Demeton (total)	mg/kg	1			<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
	Diazinon	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Dimethoate	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Disulfoton	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Ethoprop	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Fenitrothion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Fensulfothion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Fenthion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Malathion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Mevinphos (Phosdrin)	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Monocrotophos	mg/kg	10			<10	-	-	-	<10	-	-	-	<10	-	-	-	<10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
	Parathion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Phorate	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Profenofos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Prothiofos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Ronnel	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Stirophos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Trichloronate	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
Organic	Naphthalene	mg/kg	0.5	3		0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	1.5	1	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.6	2.6	0.5
	TRH C6-C10 less BTEX (F1)	mg/kg	20	45		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	110		<50	<50	<50	<50	<50	<50	<50	<50	65	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	93	54	52	<50	<50	<50	<50	<50	<50	<50	<50	53	72	89
	TRH C6 - C10	mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TPH >C10 - C16	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	69	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	93	54	53	<50	<50	<50	<50	<50	<50	<50	<50	55	74	89
	TRH >C16 - C34	mg/kg	100	5800		1200	<100	<100	<100	<100	<100	<100	<100	3500	130	<100	<100	580	<100	<100	<100	680	340	<100	3200	2000	2300	1500	1300	590	530	730	<100	810	410	2600	2600	2900
	TRH >C34 - C40	mg/kg	100	8100		<100	<100	<100	<100	<100	<100	<100	<100	360	<100	<100	<100	<100	<100	<100	<100	210	<100	<100	640	530	500	440	220	<100	200	200	<100	280	150	780	860	720
	TRH C6 - C9	mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	0.7	0.8	0.9
	Acenaphthylene	mg/kg	0.5			3.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.1	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	1.3	0.8	<0.5	4.3	6.6	11	5.2	4.4	2.8	2.4	4.2	<0.5	3.4	0.8	8.9	9.2	11
	Anthracene	mg/kg	0.5			6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	11	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	<0.5	1.8	1.2	<0.5	5.1	8.9	22	8.9	8.8	5.4	4.1	5.4	<0.5	8.4	2.3	15	16	24
	Benzo(a)anthracene	mg/kg	0.5			20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	48	2.1	<0.5	<0.5	10	1.6	<0.5	<0.5	13	7.6	1.1	40	47	67	44	31	19	16	14	<0.5	17	7.3	49	40	50
	Benzo(a)pyrene	mg/kg	0.5			18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	42	2.2	<0.5	<0.5	11	1.4	<0.5	<0.5	15	11	1	40	42	68	41	27	18	14	18	<0.5	14	6.3	44	37	37
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5			25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	64	2.9	<0.5	<0.5	14	2	<0.5	<0.5	20	15	1.3	54	61	110	56	37	24	19	23	<0.5	18	8.2	58	50	51
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5			25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	64	3.2	0.6	0.6	14	2.3	0.6	0.6	20	15	1.6	54	61	110	56	37	24	19	23	0.6	19	8.4	58	50	51
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5	4		25	1.2	1.2	1.2	1.2	1.2	1.2	1.2	64	3.4	1.2	1.2	14	2.6	1.2	1.2	20	15	1.9	54	61	110	56	37	24	20	24	1.2	19	8.7	58	50	51
	Benzo(g,h,i)perylene	mg/kg	0.5			7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	25	1.3	<0.5	<0.5	5	0.8	<0.5	<0.5	8.1	5.3	<0.5	24	25	38	19	13	8.2	7.2	6.6	<0.5	5.7	2.6	22	17	17
	Benzo(k)fluoranthene	mg/kg	0.5			15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	34	1.9	<0.5	<0.5	8.1	2	<0.5	<0.5	12	8.7	0.9	29	33	88	36	19	14	12	14	<0.5	11	5	30	28	27
	Chrysene	mg/kg	0.5			14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	31	1.7	<0.5	<0.5	8.4	1.2	<0.5	<0.5	11	7.6	0.9	29	29	50	32	21	15	12	13	<0.5	12	5.2	32	29	29
	Benzo(b+j)fluoranthene	mg/kg	0.5			17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	36	2	<0.5	<0.5	10	2.3	<0.5	<0.5	13	11	0.9	30	21	100	34	27	12	11	17	<0.5	8.4	3	25	27	23
	Dibenz(a,h)anthracene	mg/kg	0.5			0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	1.5	6.2	12	1.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.2	1.8	1.5
	Fluoranthene	mg/kg	0.5			33	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	63	3.5	<0.5	1.3	16	3	<0.5	<0.5	16	11	1.5	37	46	83	50	41	29	21	21	0.9	36	13	68	65	72
	Fluorene	mg/kg	0.5			1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	3.4	8.5	3	2.7	1.3	1	3.5	<0.5	4.3	<0.5	5.8	5.6	7.7
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			6.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	22	1	<0.5	<0.5	4.1	<0.5	<0.5	<0.5	6.4	4.1	<0.5	18	20	32	17	11	6.6	6	5.7	<0.5	4.7	2.2	18	14	14
	Naphthalene	mg/kg	0.5	3		1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	6.9	4.9	2.9	1.5	0.8	<0.5	1	<0.5	<0.5	<0.5	4.1	4.4	2.2
	Phenanthrene	mg/kg	0.5			19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	32	1.5	<0.5	0.7	7.3	1.4	<0.5	<0.5	5.5	4	0.7	14	30	65	29	29	19	13	17	0.6	29	6.2	42	48	68
	Pyrene	mg/kg	0.5			32	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	60	3.6	<0.5	1.2	16	2.9	<0.5	<0.5	16	10	1.4	38	44	79	49	40	28	20	18	0.8	33	13	68	64	68
	Total PAHs	mg/kg	0.5	400		190	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	420	21	<0.5	3.2	100	17	<0.5	<0.5	120	84	8.4	310	370	730	370	280	180	140	160	2.3	190	67	430	410	450
PCB	Aroclor 1016	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Aroclor 1232	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Aroclor 1242	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Aroclor 1248	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Aroclor 1254	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Aroclor 1260	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	PCBs (Sum of total)	mg/kg	0.5	1		<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
SVOC	2,4,5-trichlorophenol	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	2,4,6-trichlorophenol	mg/kg	0.5		

Soil Analytical Data Compared to TPH Management LImits in Soil
University of Sydney
Darlington Terraces

				Field ID	BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5	BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5	BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5	BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5	HA1	HA2	HA3	HA4	HA5	HA6
				Sample Date	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015
				Matrix_Description	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Method_Type	**Analyte**	**Units**	**LOR**	NEPM 2013 Management Limits in Soil																						
	TRH C6-C10 less BTEX (F1)	mg/kg	20	700	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	1000	<50	<50	<50	<50	<50	<50	<50	<50	65	<50	<50	<50	<50	<50	<50	<50	<50	<50	93	54	52	<50
	TRH >C16 - C34	mg/kg	100	2500	1200	<100	<100	<100	<100	<100	<100	<100	3500	130	<100	<100	580	<100	<100	<100	680	<100	3200	2000	2300	1300
	TRH >C34 - C40	mg/kg	100	10,000	<100	<100	<100	<100	<100	<100	<100	<100	360	<100	<100	<100	<100	<100	<100	<100	210	<100	640	530	500	220

Notes:

Concentration reported above adopted criteria

\- Not analysed

				Field ID	HA7	HA8	HA9	QC1	QC2	TP1_0.2	TP2_0.2	TP3_0.35	TP4_0.2	TP5_0.2	TP6_0.2
				Sample Date	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015
				Matrix_Description	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Method_Type	Analyte	Units	LOR	NEPM 2013 Management Limits in Soil											
	TRH C6-C10 less BTEX (F1)	mg/kg	20	700	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	1000	<50	<50	<50	<50	<50	<50	<50	<50	53	72	89
	TRH >C16 - C34	mg/kg	100	2500	590	530	730	340	1500	<100	810	410	2600	2600	2900
	TRH >C34 - C40	mg/kg	100	10,000	<100	200	200	<100	440	<100	280	150	780	860	720

Notes:

Concentration reported above adopted criteria

\- Not analysed

Table 3
Soil Analytical Data Compared to Ecological Criteria for a High Density Residential Land Use (EIL/ESL A/B)
University of Sydney
Darlington Terraces

				Field ID	BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5	BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5	BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5	BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5	HA1	QC1	HA2	HA3	HA4	HA5	QC2	HA6	HA7
				Sample Date	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015
				Matrix_Description	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Method_Type	**Analyte**	**Units**	**LOR**	**NEPM 2013 ESLs Urban residential and public open space, Fine Soil**																									
Heavy Metal	Arsenic	mg/kg	2	100	28	7.9	5.7	6.4	4.8	4.5	6.1	<2	19	5.1	5.9	3.9	5.7	7.6	42	11	9.3	8.6	7	9.8	12	13	12	4.7	4.9
	Chromium	mg/kg	5	190	25	28	16	13	21	10	6.4	<5	26	15	7.8	6	25	25	15	9.4	72	19	9.2	29	28	31	23	18	11
	Copper	mg/kg	5	240	110	<5	5.9	11	7	5.5	9.4	12	260	80	13	14	150	14	7.2	16	120	120	30	230	230	270	160	29	34
	Lead	mg/kg	5	1100	1300	21	25	18	36	18	17	17	2500	540	68	43	1500	55	29	31	4200	2700	260	4300	2100	3700	3200	330	310
	Nickel	mg/kg	5	310	12	<5	<5	<5	<5	<5	<5	<5	19	5.3	<5	<5	11	<5	<5	<5	8	7.8	<5	12	15	16	15	9.9	7
	Zinc	mg/kg	5	950	1200	6.6	15	7.2	63	14	<5	<5	1100	510	21	10	680	320	15	9.3	810	680	250	1300	950	1400	1300	400	590
OCP	DDT	mg/kg	0.05	180	0.27	-	-	-	<0.05	-	-	-	0.62	-	-	-	0.24	-	-	-	0.22	0.13	<0.05	0.21	<0.12	<0.66	0.15	<0.094	<0.05
Organic	Naphthalene	mg/kg	0.5	170	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	1.5	1	2.2	<0.5
	TRH C6-C10 less BTEX (F1)	mg/kg	20	180	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	120	<50	<50	<50	<50	<50	<50	<50	<50	65	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	93	54	52	<50	<50	<50
	TRH >C16 - C34	mg/kg	100	1300	1200	<100	<100	<100	<100	<100	<100	<100	3500	130	<100	<100	580	<100	<100	<100	680	340	<100	3200	2000	2300	1500	1300	590
	TRH >C34 - C40	mg/kg	100	5600	<100	<100	<100	<100	<100	<100	<100	<100	360	<100	<100	<100	<100	<100	<100	<100	210	<100	<100	640	530	500	440	220	<100
PAH	Benzo(a)pyrene	mg/kg	0.5	0.7	18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	42	2.2	<0.5	<0.5	11	1.4	<0.5	<0.5	15	11	1	40	42	68	41	27	18
	Naphthalene	mg/kg	0.5	170	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.8	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	6.9	4.9	2.9	1.5	0.8
Volatile	Benzene	mg/kg	0.1	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	85	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
	Ethylbenzene	mg/kg	0.1	70	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	105	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

Notes:

Concentration reported above adopted criteria

\- Not analysed

Table 3
Soil Analytical Data Compared to Ecological Criteria for a High Density Residential Land Use (EIL/ESL A/B)
University of Sydney
Darlington Terraces

				Field ID	HA8	HA9	TP1_0.2	TP2_0.2	TP3_0.35	TP4_0.2	TP5_0.2	TP6_0.2
				Sample Date	28/01/2015	28/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015
				Matrix_Description	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Method_Type	**Analyte**	**Units**	**LOR**	**NEPM 2013 ESLs Urban residential and public open space, Fine Soil**								
Heavy Metal	Arsenic	mg/kg	2	100	5.1	16	5.1	2.4	2.9	3.6	5	16
	Chromium	mg/kg	5	190	35	21	15	6.8	<5	11	9	12
	Copper	mg/kg	5	240	81	160	14	9.6	19	40	40	66
	Lead	mg/kg	5	1100	540	1400	250	120	620	1200	3400	1600
	Nickel	mg/kg	5	310	19	12	<5	<5	5.5	6.4	<5	23
	Zinc	mg/kg	5	950	630	930	630	72	800	390	1000	400
OCP	DDT	mg/kg	0.05	180	<0.05	0.32	-	-	-	-	-	-
Organic	Naphthalene	mg/kg	0.5	170	<0.5	<0.5	<0.5	<0.5	<0.5	2.6	2.6	0.5
	TRH C6-C10 less BTEX (F1)	mg/kg	20	180	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	120	<50	<50	<50	<50	<50	53	72	89
	TRH >C16 - C34	mg/kg	100	1300	530	730	<100	810	410	2600	2600	2900
	TRH >C34 - C40	mg/kg	100	5600	200	200	<100	280	150	780	860	720
PAH	Benzo(a)pyrene	mg/kg	0.5	0.7	14	18	<0.5	14	6.3	44	37	37
	Naphthalene	mg/kg	0.5	170	<0.5	1	<0.5	<0.5	<0.5	4.1	4.4	2.2
Volatile	Benzene	mg/kg	0.1	50	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
	Toluene	mg/kg	0.1	85	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1
	Ethylbenzene	mg/kg	0.1	70	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	105	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

Notes:

Concentration reported above adopted criteria

\- Not analysed

Table 4
Soil Analytical Data Compared to Waste Classification Criteria (2009)
University of Sydney
Darlington Terraces

Method_Type	Analyte	Units	LOR	NSW 2008 General Solid Waste (No Leaching)	NSW 2008 Restricted Solid Waste (No Leaching)	BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5	BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5	BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5	BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5	HA1	HA2	HA3	HA4	HA5	HA6	HA7	HA8	HA9	QC1	QC2	TP1_0.2	TP2_0.2	TP3_0.35	TP4_0.2	TP5_0.2	TP6_0.2
	Field ID					BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5	BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5	BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5	BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5	HA1	HA2	HA3	HA4	HA5	HA6	HA7	HA8	HA9	QC1	QC2	TP1_0.2	TP2_0.2	TP3_0.35	TP4_0.2	TP5_0.2	TP6_0.2
	Sample Date					28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	27/01/2015	27/01/2015	27/01/2015	27/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015	29/01/2015
	Matrix_Description					SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
ESDAT Combined Compounds	Monocylic aromatic hydrocarbons EPAVic	mg/kg				<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.35	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	0.6	0.45	<0.6
	Organochlorine pesticides EPAVic	mg/kg				0.965	-	-	-	<1.15	-	-	-	1.375	-	-	-	0.925	-	-	-	0.7815	<1.15	0.785	<1.242	<1.76	<1.194	<1.15	<1.15	1.835	0.7725	0.785	-	-	-	-	-	-
	Other organochlorine pesticides EPAVic	mg/kg				<0.9	-	-	-	<0.9	-	-	-	<0.98	-	-	-	<0.9	-	-	-	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	<0.9	1	<0.9	<0.9	-	-	-	-	-	-
	Phenols (non-halogenated) EPAVic	mg/kg				<2	-	-	-	<2	-	-	-	1.65	-	-	-	<2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-
	Phenols(halogenated) EPAVic	mg/kg				<3.5	-	-	-	<3.5	-	-	-	<3.5	-	-	-	<3.5	-	-	-	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	-	-	-	-	-	-
	Polycylic aromatic hydrocarbons EPAVic	mg/kg				177.6	<7.5	5.35	<7.5	<7.5	<7.5	<7.5	<7.5	388.4	20.3	<7.5	6.2	91.95	16.05	<7.5	<7.5	107.1	9.5	282.7	348.3	629.4	251.5	167.6	129.5	142.4	73.35	338.8	5.3	179.3	64.9	409.7	379.8	429.3
	Carcinogenic PAHs as B(a)P TPE	mg/kg				24.72	<1.21	<1.21	<1.21	<1.21	<1.21	<1.21	<1.21	64.16	3.18	<1.21	<1.21	14.6	2.285	<1.21	<1.21	19.88	1.577	53.73	60.84	109.6	37.24	23.64	18.94	23.52	15.57	56.11	<1.21	18.54	8.378	58.94	50.16	50.36
Heavy Metal	Arsenic	mg/kg	2	100	400	28	7.9	5.7	6.4	4.8	4.5	6.1	<2	19	5.1	5.9	3.9	5.7	7.6	42	11	9.3	7	9.8	12	13	4.7	4.9	5.1	16	8.6	12	5.1	2.4	2.9	3.6	5	16
	Cadmium	mg/kg	0.4	20	80	2.2	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	1	<0.4	<0.4	<0.4	1.1	<0.4	<0.4	<0.4	0.8	0.5	1.2	1.5	3.1	<0.4	0.5	0.6	1.6	0.7	1.8	3.1	<0.4	0.5	0.7	1	<0.4
	Chromium	mg/kg	5	100	400	25	28	16	13	21	10	6.4	<5	26	15	7.8	6	25	25	15	9.4	72	9.2	29	28	31	18	11	35	21	19	23	15	6.8	<5	11	9	12
	Copper	mg/kg	5			110	<5	5.9	11	7	5.5	9.4	12	260	80	13	14	150	14	7.2	16	120	30	230	230	270	29	34	81	160	120	160	14	9.6	19	40	40	66
	Lead	mg/kg	5	100	400	1300	21	25	18	36	18	17	17	2500	540	68	43	1500	55	29	31	4200	260	4300	2100	3700	330	310	540	1400	2700	3200	250	120	620	1200	3400	1600
	Mercury	mg/kg	0.05	4	16	0.58	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.49	0.39	<0.05	<0.05	0.27	0.05	<0.05	<0.05	1.2	0.13	0.8	1.3	0.67	0.22	0.29	0.19	0.76	0.73	0.45	0.12	0.27	0.92	0.21	0.67	0.76
	Nickel	mg/kg	5	40	160	12	<5	<5	<5	<5	<5	<5	<5	19	5.3	<5	<5	11	<5	<5	<5	8	<5	12	15	16	9.9	7	19	12	7.8	15	<5	<5	5.5	6.4	<5	23
	Zinc	mg/kg	5			1200	6.6	15	7.2	63	14	<5	<5	1100	510	21	10	680	320	15	9.3	810	250	1300	950	1400	400	590	630	930	680	1300	630	72	800	390	1000	400
OCP	4,4-DDE	mg/kg	0.05			0.17	-	-	-	<0.05	-	-	-	0.19	-	-	-	0.16	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.11	<0.05	-	-	-	-	-	-
	a-BHC	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Aldrin	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	b-BHC	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Chlordane	mg/kg	0.1			<0.1	-	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	-	-	-	-	-	-
	d-BHC	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	DDD	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.073	<0.05	<0.05	<0.072	<0.05	<0.05	<0.05	<0.05	<0.14	<0.065	<0.22	-	-	-	-	-	-
	DDT	mg/kg	0.05			0.27	-	-	-	<0.05	-	-	-	0.62	-	-	-	0.24	-	-	-	0.22	<0.05	0.21	<0.12	<0.66	<0.094	<0.05	<0.05	0.32	0.13	0.15	-	-	-	-	-	-
	Dieldrin	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.19	<0.05	<0.05	-	-	-	-	-	-
	Endosulfan I	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endosulfan II	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endosulfan sulphate	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.13	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endrin	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endrin aldehyde	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Endrin ketone	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	g-BHC (Lindane)	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Heptachlor	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Heptachlor epoxide	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Hexachlorobenzene	mg/kg	0.05			<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
	Methoxychlor	mg/kg	0.2			<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-
	Toxaphene	mg/kg	1			<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
OPP	Azinophos methyl	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Chlorpyrifos	mg/kg	0.5	4	16	<1	-	-	-	<0.5	-	-	-	<1.6	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.7	<1.7	<1.8	<0.5	<0.6	<1.3	<0.5	<1.1	-	-	-	-	-	-
	Coumaphos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Demeton (total)	mg/kg	1			<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-
	Diazinon	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Dichlorvos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Dimethoate	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Disulfoton	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Ethoprop	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Fenitrothion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Fensulfothion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Fenthion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Malathion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Methyl parathion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Mevinphos (Phosdrin)	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Monocrotophos	mg/kg	10			<10	-	-	-	<10	-	-	-	<10	-	-	-	<10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	-	-	-	-	-	-
	Parathion	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Phorate	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Profenofos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Prothiofos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Ronnel	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Stirophos	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
	Trichloronate	mg/kg	0.5			<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-
Organic	Naphthalene	mg/kg	0.5			0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	1.5	2.2	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	2.6	2.6	0.5
	TRH C6-C10 less BTEX (F1)	mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	65	<50	<50	<50	<50	<50	<50	<50	<50	<50	93	54	52	<50	<50	<50	<50	<50	<50	<50	<50	<50	53	72	89
	TRH C6 - C10	mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TPH >C10 - C16	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	69	<50	<50	<50	<50	<50	<50	<50	<50	<50	93	54	53	<50	<50	<50	<50	<50	<50	<50	<50	<50	55	74	89
	TRH >C16 - C34	mg/kg	100			1200	<100	<100	<100	<100	<100	<100	<100	3500	130	<100	<100	580	<100	<100	<100	680	<100	3200	2000	2300	1300	590	530	730	340	1500	<100	810	410	2600	2600	2900
	TRH >C34 - C40	mg/kg	100			<100	<100	<100	<100	<100	<100	<100	<100	360	<100	<100	<100	<100	<100	<100	<100	210	<100	640	530	500	220	<100	200	200	<100	440	<100	280	150	780	860	720
	TRH C6 - C9	mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.8	0.9
	Acenaphthylene	mg/kg	0.5			3.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.1	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	1.3	<0.5	4.3	6.6	11	4.4	2.8	2.4	4.2	0.8	5.2	<0.5	3.4	0.8	8.9	9.2	11
	Anthracene	mg/kg	0.5			6.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	11	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	<0.5	1.8	<0.5	5.1	8.9	22	8.8	5.4	4.1	5.4	1.2	8.9	<0.5	8.4	2.3	15	16	24
	Benzo(a)anthracene	mg/kg	0.5			20	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	48	2.1	<0.5	<0.5	10	1.6	<0.5	<0.5	13	1.1	40	47	67	31	19	16	14	7.6	44	<0.5	17	7.3	49	40	50
	Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	42	2.2	<0.5	<0.5	11	1.4	<0.5	<0.5	15	1	40	42	68	27	18	14	18	11	41	<0.5	14	6.3	44	37	37
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5			25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	64	2.9	<0.5	<0.5	14	2	<0.5	<0.5	20	1.3	54	61	110	37	24	19	23	15	56	<0.5	18	8.2	58	50	51
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5			25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	64	3.2	0.6	0.6	14	2.3	0.6	0.6	20	1.6	54	61	110	37	24	19	23	15	56	0.6	19	8.4	58	50	51
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5			25	1.2	1.2	1.2	1.2	1.2	1.2	1.2	64	3.4	1.2	1.2	14	2.6	1.2	1.2	20	1.9	54	61	110	37	24	20	24	15	56	1.2	19	8.7	58	50	51
	Benzo(g,h,i)perylene	mg/kg	0.5			7.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	25	1.3	<0.5	<0.5	5	0.8	<0.5	<0.5	8.1	<0.5	24	25	38	13	8.2	7.2	6.6	5.3	19	<0.5	5.7	2.6	22	17	17
	Benzo(k)fluoranthene	mg/kg	0.5			15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	34	1.9	<0.5	<0.5	8.1	2	<0.5	<0.5	12	0.9	29	33	88	19	14	12	14	8.7	36	<0.5	11	5	30	28	27
	Chrysene	mg/kg	0.5			14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	31	1.7	<0.5	<0.5	8.4	1.2	<0.5	<0.5	11	0.9	29	29	50	21	15	12	13	7.6	32	<0.5	12	5.2	32	29	29
	Benzo[b+j]fluoranthene	mg/kg	0.5			17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	36	2	<0.5	<0.5	10	2.3	<0.5	<0.5	13	0.9	30	21	100	27	12	11	17	11	34	<0.5	8.4	3	25	27	23
	Dibenz(a,h)anthracene	mg/kg	0.5			0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	6.2	12	1.1	<0.5	<0.5	<0.5	1.3	1.5	<0.5	<0.5	<0.5	2.2	1.8	1.5
	Fluoranthene	mg/kg	0.5			33	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	63	3.5	<0.5	1.3	16	3	<0.5	<0.5	16	1.5	37	46	83	41	29	21	21	11	50	0.9	36	13	68	65	72
	Fluorene	mg/kg	0.5			1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	3.4	8.5	2.7	1.3	1	3.5	<0.5	3	<0.5	4.3	<0.5	5.8	5.6	7.7
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			6.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	22	1	<0.5	<0.5	4.1	<0.5	<0.5	<0.5	6.4	<0.5	18	20	32	11	6.6	6	5.7	4.1	17	<0.5	4.7	2.2	18	14	14
	Naphthalene	mg/kg	0.5			1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.8	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	1.3	<0.5	1.7	6.9	4.9	1.5	0.8	<0.5	1	<0.5	2.9	<0.5	<0.5	<0.5	4.1	4.4	2.2
	Phenanthrene	mg/kg	0.5			19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	32	1.5	<0.5	0.7	7.3	1.4	<0.5	<0.5	5.5	0.7	14	30	65	29	19	13	17	4	29	0.6	29	6.2	42	48	68
	Pyrene	mg/kg	0.5			32	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	60	3.6	<0.5	1.2	16	2.9	<0.5	<0.5	16	1.4	38	44	79	40	28	20	18	10	49	0.8	33	13	68	64	68
	Total PAHs	mg/kg	0.5			190	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	420	21	<0.5	3.2	100	17	<0.5	<0.5	120	8.4	310	370	730	280	180	140	160	84	370	2.3	190	67	430	410	450
PCB	Aroclor 1016	mg/kg	0.5			<0.5	-	-	-	<0.5

Table 5
Soil Analytical Data Compared to Waste Classification TCLP Criteria (2009)
University of Sydney
Darlington Terraces

					Field_ID	BH03_0.2	HA3	HA4	HA5	HA6
					Sampled_Date-Time	28/01/2015	28/01/2015	28/01/2015	28/01/2015	28/01/2015
Method_Type	**ChemName**	**Units**	**EQL**	General Solid Waste (TCLP1)	Restricted Solid Waste (TCLP2)					
Heavy Metal	Lead	mg/L	0.01	5	20	1.1	5.1	0.47	1.6	0.31
PAH	Acenaphthene	µg/L	1			<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	1			<1	<1	<1	<1	<1
	Anthracene	µg/L	1			<1	<1	<1	<1	<1
	Benzo(a)anthracene	µg/L	1			<1	<1	5	<1	<1
	Benzo(a)pyrene	µg/L	1	40	160	<1	<1	8	<1	<1
	Benzo(g,h,i)perylene	µg/L	1			<1	<1	6	<1	<1
	Benzo(k)fluoranthene	µg/L	1			<1	<1	4	<1	<1
	Chrysene	µg/L	1			<1	<1	5	<1	<1
	Benzo[b+j]fluoranthene	mg/L	0.001			<0.001	<0.001	0.009	<0.001	<0.001
	Dibenz(a,h)anthracene	µg/L	1			<1	<1	1	<1	<1
	Fluoranthene	µg/L	1			1	<1	6	<1	<1
	Fluorene	µg/L	1			<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1			<1	<1	5	<1	<1
	Naphthalene	µg/L	1			<1	<1	<1	<1	<1
	Phenanthrene	µg/L	1			1	<1	1	<1	<1
	Pyrene	µg/L	1			1	<1	7	<1	<1
	Total PAHs	µg/L	2			3	<1	57	<1	<1
TCLP	pH (Initial)	pH_Units	0.1			6.4	7.2	7.7	6.8	9
	pH (after HCL)	pH_Units	0.1			2	2	2	2	2

Notes:
Concentration above TCLP1 criteria

Table 6
Comparison of Primary Duplicate Soil Sample Analytical Results
University of Sydney
Darlington Terraces

			Lab Report Number	445754	445754		445754	445754		445754	Interlab_D	
			Field ID	HA1	QC1	**RPD**	HA5	QC2	**RPD**	HA5	QC2A	**RPD**
			Sampled Date/Time	28/01/2015	28/01/2015		28/01/2015	28/01/2015		28/01/2015	28/01/2015	
Method_Type	**Analyte**	**Units**	**LOR**									
Organic	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	1.5	1.0	40	1.5	0.6	**86**
PAH	Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	4.9	2.9	**51**	4.9	0.6	**156**
Volatile	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0
Organic	TRH C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TRH >C10-C16 less Naphthalene (F	mg/kg	50	<50.0	<50.0	0	52.0	<50.0	0	52.0	<50.0	0
	TRH C6 - C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	TPH >C10 - C16	mg/kg	50	<50.0	<50.0	0	53.0	<50.0	0	53.0	<50.0	0
	TRH >C16 - C34	mg/kg	100	680.0	340.0	**67**	2300.0	1500.0	42	2300.0	660.0	**111**
	TRH >C34 - C40	mg/kg	100	210.0	<100.0	0	500.0	440.0	13	500.0	120.0	**123**
	TRH C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
TPH	TRH C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	21.0	22.0	5	21.0	<50.0	0
	TRH C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	390.0	230.0	**52**	1500.0	1200.0	22	1500.0	470.0	**105**
	TRH C29 - C36	mg/kg	50 (Primary): 100 (Interlab)	360.0	110.0	**106**	970.0	360.0	**92**	970.0	280.0	**110**
	TRH C10 - C36 (Sum of total)	mg/kg	50	750.0	340.0	**75**	2500.0	1600.0	44	2500.0	750.0	**108**
Inorganic	Moisture Content (dried @ 103°C)	%	0.1	21.0	19.0	10	28.0	25.0	11	28.0		
Heavy Metal	Arsenic	mg/kg	2 (Primary): 5 (Interlab)	9.3	8.6	8	13.0	12.0	8	13.0	16.0	21
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	0.8	0.7	13	3.1	1.8	**53**	3.1	2.0	43
	Chromium	mg/kg	5 (Primary): 2 (Interlab)	72.0	19.0	**116**	31.0	23.0	30	31.0	25.0	21
	Copper	mg/kg	5	120.0	120.0	0	270.0	160.0	**51**	270.0	174.0	43
	Lead	mg/kg	5	4200.0	2700.0	**43**	3700.0	3200.0	14	3700.0	3360.0	10
	Mercury	mg/kg	0.05 (Primary): 0.1 (Interlab)	1.2	0.73	**49**	0.67	0.45	39	0.67	0.7	4
	Nickel	mg/kg	5 (Primary): 2 (Interlab)	8.0	7.8	3	16.0	15.0	6	16.0	23.0	36
	Zinc	mg/kg	5	810.0	680.0	17	1400.0	1300.0	7	1400.0	1250.0	11
OCP	4,4-DDE	mg/kg	0.05	<0.05	0.11	0	<0.05	<0.05	0	<0.05	<0.05	0
	a-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Aldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	b-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Chlordane	mg/kg	0.1 (Primary): 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0
	d-BHC	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	DDD	mg/kg	0.05	<0.073	<0.065	0	<0.05	<0.22	0	<0.05	<0.05	0
	DDT	mg/kg	0.05 (Primary): 0.2 (Interlab)	0.22	0.13	**51**	<0.66	0.15	0	<0.66	<0.2	0
	Dieldrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan I	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan II	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endosulfan sulphate	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Endrin ketone	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	g-BHC (Lindane)	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Heptachlor	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Hexachlorobenzene	mg/kg	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
	Methoxychlor	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	Toxaphene	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
OPP	Azinophos methyl	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Chlorpyrifos	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<1.7	<1.1	0	<1.7	<0.05	0
	Coumaphos	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Diazinon	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Dichlorvos	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Dimethoate	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Disulfoton	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Ethoprop	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Fenitrothion	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Fensulfothion	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Fenthion	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Malathion	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Methyl parathion	mg/kg	0.5 (Primary): 0.2 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.2	0
	Mevinphos (Phosdrin)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Monocrotophos	mg/kg	10 (Primary): 0.2 (Interlab)	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<0.2	0
	Parathion	mg/kg	0.5 (Primary): 0.2 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.2	0
	Phorate	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Prothiofos	mg/kg	0.5 (Primary): 0.05 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0
	Ronnel	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Stirophos	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Trichloronate	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
PAH	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	1.0	<0.5	0	1.0	<0.5	0
	Acenaphthylene	mg/kg	0.5	1.3	0.8	48	11.0	5.2	**72**	11.0	3.3	**108**
	Anthracene	mg/kg	0.5	1.8	1.2	40	22.0	8.9	**85**	22.0	4.3	**135**
	Benzo(a)anthracene	mg/kg	0.5	13.0	7.6	**52**	67.0	44.0	41	67.0	20.6	**106**
	Benzo(a)pyrene	mg/kg	0.5	15.0	11.0	31	68.0	41.0	50	68.0	21.7	**103**
	Benzo(a)pyrene TEQ (lower bound)	mg/kg	0.5	20.0	15.0	29	110.0	56.0	**65**	110.0		
	Benzo(a)pyrene TEQ (medium boun	mg/kg	0.5	20.0	15.0	29	110.0	56.0	**65**	110.0		
	Benzo(a)pyrene TEQ (upper bound)	mg/kg	0.5	20.0	15.0	29	110.0	56.0	**65**	110.0		
	Benzo(g,h,i)perylene	mg/kg	0.5	8.1	5.3	42	38.0	19.0	**67**	38.0	8.2	**129**
	Benzo(k)fluoranthene	mg/kg	0.5	12.0	8.7	32	88.0	36.0	**84**	88.0	6.9	**171**
	Chrysene	mg/kg	0.5	11.0	7.6	37	50.0	32.0	44	50.0	18.5	**92**
	Benzo[b+j]fluoranthene	mg/kg	0.5	13.0	11.0	17	100.0	34.0	**99**	100.0	17.7	**140**
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	1.3	0	12.0	1.5	**156**	12.0	1.8	**148**
	Fluoranthene	mg/kg	0.5	16.0	11.0	37	83.0	50.0	50	83.0	36.0	**79**
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	8.5	3.0	**96**	8.5	1.0	**158**
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	6.4	4.1	44	32.0	17.0	**61**	32.0	7.1	**127**
	Phenanthrene	mg/kg	0.5	5.5	4.0	32	65.0	29.0	**77**	65.0	15.5	**123**
	Pyrene	mg/kg	0.5	16.0	10.0	46	79.0	49.0	47	79.0	37.2	**72**
	Total PAHs	mg/kg	0.5	120.0	84.0	35	730.0	370.0	**65**	730.0	200.0	**114**
OPP	Demeton (total)	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0		
	Profenofos	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
SVOC	2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	2-nitrophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	3-&4-methylphenol	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0
	4-chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Pentachlorophenol	mg/kg	1 (Primary): 2 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<2.0	0
	Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
PCB	Aroclor 1016	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Aroclor 1232	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Aroclor 1242	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Aroclor 1248	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Aroclor 1254	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Aroclor 1260	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	PCBs (Sum of total)	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (0-10 x EQL); 30 (10-20 x EQL); 30 (> 20 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

Table 7
Analytical Data: Rinsate Blank, Trip Blank and Trip Spike Samples
University of Sydney
Darlington Terraces

			Field ID	R1	RB	TB1*	TS1 (% recovery)	TB	TS (% recovery)
			Sample Date	28/01/2015	6/02/2015	28/01/2015	28/01/2015	6/02/2015	6/02/2015
			Matrix_Type	WATER	WATER	SOIL	SOIL	WATER	WATER
Method_Type	**Analyte**	**Units**	**LOR**						
Heavy Metal	Arsenic	mg/L	0.005	<0.005	<0.001	-	-	-	-
	Cadmium	mg/L	0.0005	<0.0005	<0.0002	-	-	-	-
	Chromium	mg/L	0.005	<0.005	<0.001	-	-	-	-
	Copper	mg/L	0.005	<0.005	<0.001	-	-	-	-
	Lead	mg/L	0.005	<0.005	<0.001	-	-	-	-
	Mercury	mg/L	0.0001	<0.0001	<0.0001	-	-	-	-
	Nickel	mg/L	0.005	<0.005	<0.001	-	-	-	-
	Zinc	mg/L	0.005	<0.005	<0.001	-	-	-	-
Organic	Naphthalene	µg/L	20	<20		-	-	-	-
	TRH C6-C10 less BTEX (F1)	mg/L	0.02	<0.02		-	-	-	-
	TRH >C10-C16 less Naphthalene (F2)	mg/L	0.05	<0.05		-	-	-	-
	TRH C6 - C10	mg/L	0.02	<0.02		-	-	-	-
	TPH >C10 - C16	mg/L	0.05	<0.05		-	-	-	-
	TRH >C16 - C34	mg/L	0.1	<0.1		-	-	-	-
	TRH >C34 - C40	mg/L	0.1	<0.1		-	-	-	-
	TRH C6 - C9	µg/L	20	<20		-	-	-	-
TPH	TRH C10 - C14	µg/L	50	<50		-	-	-	-
	TRH C15 - C28	µg/L	100	<100		-	-	-	-
	TRH C29 - C36	µg/L	100	<100		-	-	-	-
	TRH C10 - C36 (Sum of total)	µg/L	100	<100		-	-	-	-
Volatile	Benzene	µg/L	1	<1	<1	<0.1	66	<1	103
	Ethylbenzene	µg/L	1	<1	<1	<0.1	66	<1	100
	Toluene	µg/L	1	<1	<1	<0.1	67	<1	97
	Xylene (m & p)	µg/L	2	<2	<2	<0.2	67	<2	96
	Xylene (o)	µg/L	1	<1	<1	<0.1	66	<1	97
	Xylene Total	µg/L	3	<3	<3	<0.3	67	<3	97

Notes:
* Volatile concentrations reported in mg/kg for TB1

Table 8
Groundwater Analytical Data Compared to Groundwater Investigation Levels (GIL)
University of Sydney
Darlington Terraces

Field_ID	BH1
Sampled_Date-Time	6/02/2015

Method_Type	**ChemName**	**Units**	**EQL**	**GW GILs**	
Heavy Metal	Mercury (Filtered)	mg/L	0.0001	0.0006	<0.0001
Heavy Metals	Arsenic (Filtered)	mg/L	0.001	0.01	<0.001
	Cadmium (Filtered)	mg/L	0.0002	0.0002	<0.0002
	Chromium (Filtered)	mg/L	0.001	0.001	<0.001
	Copper (Filtered)	mg/L	0.001	0.0014	0.001
	Lead (Filtered)	mg/L	0.001	0.0034	<0.001
	Nickel (Filtered)	mg/L	0.001	0.011	0.001
	Zinc (Filtered)	mg/L	0.001	0.008	0.021
Volatile	Benzene	µg/L	1	1	<1
	Toluene	µg/L	1	180	<1
	Ethylbenzene	µg/L	1	80	<1
	Xylene (m & p)	µg/L	2	75	<2
	Xylene (o)	µg/L	1	350	<1
	Xylene Total	µg/L	3	600	<3

Notes:

Concentration reported above nominated criteria

Appendix D - Laboratory Analytical Test Certificates & Chain of Custody Documentation

coffey

Chain of Custody

No: 07261

Laboratory Quotation / Order No:

Job No: Geotech 25176A13 Sheet 1 of 1

Dispatch to: (Address & Phone No.) Eurofins MGT	Sampled by: Sanit	Consigning Officer: Date Dispatched: 29/1/15 # 446748
Attention:	Project Manager: (report results to) Matthew Loche	Courier Service: Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
SANIT UPADHYAYA (Sign) →	29/1/15	12:20pm	PARISH	29/1/15	12:20pm

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals	Sample Condition on Receipt
	SOIL	1S, 1Zip	BH1_0.2	28/1					
			0.5						
			1.0						
			1.5						
Analysis to be determined			BH2_0.2	27/1					
			0.5						
			1.0						
			1.5						
			BH3_0.2	28/1					
			0.5						
			1.0						
			1.5						
			BH4_0.2	27/1					
			0.5						
			1.0						
			1.5						

Analyses Required

Special Laboratory Instructions:

Detection Limits:

Turnaround Required: Std

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey BLUE: To be returned with results.

29 JAN 2015 15:25

coffey

Chain of Custody

No: 07261

Laboratory Quotation / Order No:

Job No:

Sheet: of

Research to:
Address:
Phone No:

Sampled by:

Consigning Officer:

Date Dispatched:

Attention: Pick up of samples organised for 29/1 (Darlington Rd DARLINGTON)

Project Manager:
Report Needs to:

Courier Service:

Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals	B1	M8	DH	B15	Phenols						Sample Condition on Receipt
									✓	✓	✓	✓	✓						
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓	✓	✓						
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓	✓	✓						
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓	✓	✓						
									✓	✓	✓								
									✓	✓	✓								
									✓	✓	✓								

Analyses Required

Special Laboratory Instructions:

Detection Limits:

Turnaround Required:

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to Interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	GEOTLCOV25176AB
COC number:	07261
Turn around time:	5 Day
Date/Time received:	Jan 29, 2015 3:25 PM
Eurofins | mgt reference:	**445748**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 14.5 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (02) 4965 4492 or by e.mail: AndrewBlack@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Locke**

Report **445748-S**
Project name GEOTLCOV25176AB
Received Date Jan 29, 2015

Client Sample ID			**BH1_0.2**	**BH1_0.5**	**BH1_1.0**	**BH1_1.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14878**	**S15-Ja14879**	**S15-Ja14880**	**S15-Ja14881**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	790	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	380	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	1200	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	99	90	97	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	0.9	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	1200	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	25	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	25	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	25	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	3.7	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	6.2	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	20	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	18	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	17	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	7.1	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	15	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	14	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	0.7	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	33	< 0.5	1.0	< 0.5

Client Sample ID			BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14878	S15-Ja14879	S15-Ja14880	S15-Ja14881
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	1.4	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	6.1	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	1.1	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	19	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	32	< 0.5	1.1	< 0.5
Total PAH	0.5	mg/kg	190	< 0.5	2.1	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97	103	107	101
p-Terphenyl-d14 (surr.)	1	%	101	115	116	114
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	0.17	-	-	-
4.4'-DDT	0.05	mg/kg	0.27	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	88	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	107	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	88	-	-	-
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	-	-	-
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1	-	-	-

Client Sample ID			BH1_0.2	BH1_0.5	BH1_1.0	BH1_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14878	S15-Ja14879	S15-Ja14880	S15-Ja14881
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Speciated Phenols						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2-Nitrophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Phenol-d5 (surr.)	1	%	94	-	-	-
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 1	-	-	-
Coumaphos	0.5	mg/kg	< 0.5	-	-	-
Demeton (total)	1	mg/kg	< 1	-	-	-
Diazinon	0.5	mg/kg	< 0.5	-	-	-
Dichlorvos	0.5	mg/kg	< 0.5	-	-	-
Dimethoate	0.5	mg/kg	< 0.5	-	-	-
Disulfoton	0.5	mg/kg	< 0.5	-	-	-
Ethoprop	0.5	mg/kg	< 0.5	-	-	-
Fenitrothion	0.5	mg/kg	< 0.5	-	-	-
Fensulfothion	0.5	mg/kg	< 0.5	-	-	-
Fenthion	0.5	mg/kg	< 0.5	-	-	-
Methyl azinphos	0.5	mg/kg	< 0.5	-	-	-
Malathion	0.5	mg/kg	< 0.5	-	-	-
Methyl parathion	0.5	mg/kg	< 0.5	-	-	-
Mevinphos	0.5	mg/kg	< 0.5	-	-	-
Monocrotophos	10	mg/kg	< 10	-	-	-
Parathion	0.5	mg/kg	< 0.5	-	-	-
Phorate	0.5	mg/kg	< 0.5	-	-	-
Profenofos	0.5	mg/kg	< 0.5	-	-	-
Prothiofos	0.5	mg/kg	< 0.5	-	-	-
Ronnel	0.5	mg/kg	< 0.5	-	-	-
Stirophos	0.5	mg/kg	< 0.5	-	-	-
Trichloronate	0.5	mg/kg	< 0.5	-	-	-
Triphenylphosphate (surr.)	1	%	95	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	28	7.9	5.7	6.4
Cadmium	0.4	mg/kg	2.2	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	25	28	16	13
Copper	5	mg/kg	110	< 5	5.9	11
Lead	5	mg/kg	1300	21	25	18
Mercury	0.05	mg/kg	0.58	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	12	< 5	< 5	< 5
Zinc	5	mg/kg	1200	6.6	15	7.2
% Moisture	0.1	%	22	22	27	18

Client Sample ID			BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14882	S15-Ja14883	S15-Ja14884	S15-Ja14885
Date Sampled			Jan 27, 2015	Jan 27, 2015	Jan 27, 2015	Jan 27, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	97	93	95	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	106	100	104	101
p-Terphenyl-d14 (surr.)	1	%	118	113	116	112
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-

Client Sample ID			BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14882	S15-Ja14883	S15-Ja14884	S15-Ja14885
Date Sampled			Jan 27, 2015	Jan 27, 2015	Jan 27, 2015	Jan 27, 2015
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	130	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	134	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	130	-	-	-
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	-	-	-
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1	-	-	-
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2-Nitrophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Phenol-d5 (surr.)	1	%	102	-	-	-
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 0.5	-	-	-
Coumaphos	0.5	mg/kg	< 0.5	-	-	-
Demeton (total)	1	mg/kg	< 1	-	-	-
Diazinon	0.5	mg/kg	< 0.5	-	-	-
Dichlorvos	0.5	mg/kg	< 0.5	-	-	-
Dimethoate	0.5	mg/kg	< 0.5	-	-	-
Disulfoton	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			BH2_0.2	BH2_0.5	BH2_1.0	BH2_1.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14882**	**S15-Ja14883**	**S15-Ja14884**	**S15-Ja14885**
Date Sampled			**Jan 27, 2015**	**Jan 27, 2015**	**Jan 27, 2015**	**Jan 27, 2015**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides (OP)						
Ethoprop	0.5	mg/kg	< 0.5	-	-	-
Fenitrothion	0.5	mg/kg	< 0.5	-	-	-
Fensulfothion	0.5	mg/kg	< 0.5	-	-	-
Fenthion	0.5	mg/kg	< 0.5	-	-	-
Methyl azinphos	0.5	mg/kg	< 0.5	-	-	-
Malathion	0.5	mg/kg	< 0.5	-	-	-
Methyl parathion	0.5	mg/kg	< 0.5	-	-	-
Mevinphos	0.5	mg/kg	< 0.5	-	-	-
Monocrotophos	10	mg/kg	< 10	-	-	-
Parathion	0.5	mg/kg	< 0.5	-	-	-
Phorate	0.5	mg/kg	< 0.5	-	-	-
Profenofos	0.5	mg/kg	< 0.5	-	-	-
Prothiofos	0.5	mg/kg	< 0.5	-	-	-
Ronnel	0.5	mg/kg	< 0.5	-	-	-
Stirophos	0.5	mg/kg	< 0.5	-	-	-
Trichloronate	0.5	mg/kg	< 0.5	-	-	-
Triphenylphosphate (surr.)	1	%	106	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	4.8	4.5	6.1	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	10	6.4	< 5
Copper	5	mg/kg	7.0	5.5	9.4	12
Lead	5	mg/kg	36	18	17	17
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	63	14	< 5	< 5
% Moisture	0.1	%	26	26	22	23

Client Sample ID			BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14886**	**S15-Ja14887**	**S15-Ja14888**	**S15-Ja14889**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	24	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	2100	79	< 50	< 50
TRH C29-C36	50	mg/kg	1400	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	3500	79	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	0.5	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	96	92	98	87

Client Sample ID			BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14886	S15-Ja14887	S15-Ja14888	S15-Ja14889
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	4.4	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	69	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	65	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	3500	130	< 100	< 100
TRH >C34-C40	100	mg/kg	360	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	64	2.9	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	64	3.2	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	64	3.4	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	6.1	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	11	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	48	2.1	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	42	2.2	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	36	2.0	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	25	1.3	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	34	1.9	< 0.5	< 0.5
Chrysene	0.5	mg/kg	31	1.7	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	7.6	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	63	3.5	< 0.5	1.3
Fluorene	0.5	mg/kg	2.0	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	22	1.0	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	3.8	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	32	1.5	< 0.5	0.7
Pyrene	0.5	mg/kg	60	3.6	< 0.5	1.2
Total PAH	0.5	mg/kg	420	21	< 0.5	3.2
2-Fluorobiphenyl (surr.)	1	%	104	103	97	96
p-Terphenyl-d14 (surr.)	1	%	113	116	110	113
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	0.19	-	-	-
4.4'-DDT	0.05	mg/kg	0.62	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.13	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-

Client Sample ID			BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14886	S15-Ja14887	S15-Ja14888	S15-Ja14889
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	92	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	107	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	92	-	-	-
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
Phenol	0.5	mg/kg	0.9	-	-	-
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	-	-	-
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	1.1	-	-	-
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2-Nitrophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Phenol-d5 (surr.)	1	%	103	-	-	-
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 1.6	-	-	-
Coumaphos	0.5	mg/kg	< 0.5	-	-	-
Demeton (total)	1	mg/kg	< 1	-	-	-
Diazinon	0.5	mg/kg	< 0.5	-	-	-
Dichlorvos	0.5	mg/kg	< 0.5	-	-	-
Dimethoate	0.5	mg/kg	< 0.5	-	-	-
Disulfoton	0.5	mg/kg	< 0.5	-	-	-
Ethoprop	0.5	mg/kg	< 0.5	-	-	-
Fenitrothion	0.5	mg/kg	< 0.5	-	-	-
Fensulfothion	0.5	mg/kg	< 0.5	-	-	-
Fenthion	0.5	mg/kg	< 0.5	-	-	-
Methyl azinphos	0.5	mg/kg	< 0.5	-	-	-
Malathion	0.5	mg/kg	< 0.5	-	-	-
Methyl parathion	0.5	mg/kg	< 0.5	-	-	-
Mevinphos	0.5	mg/kg	< 0.5	-	-	-
Monocrotophos	10	mg/kg	< 10	-	-	-
Parathion	0.5	mg/kg	< 0.5	-	-	-
Phorate	0.5	mg/kg	< 0.5	-	-	-
Profenofos	0.5	mg/kg	< 0.5	-	-	-
Prothiofos	0.5	mg/kg	< 0.5	-	-	-
Ronnel	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			BH3_0.2	BH3_0.5	BH3_1.0	BH3_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14886	S15-Ja14887	S15-Ja14888	S15-Ja14889
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Organophosphorus Pesticides (OP)						
Stirophos	0.5	mg/kg	< 0.5	-	-	-
Trichloronate	0.5	mg/kg	< 0.5	-	-	-
Triphenylphosphate (surr.)	1	%	97	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	19	5.1	5.9	3.9
Cadmium	0.4	mg/kg	1.0	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	26	15	7.8	6.0
Copper	5	mg/kg	260	80	13	14
Lead	5	mg/kg	2500	540	68	43
Mercury	0.05	mg/kg	0.49	0.39	< 0.05	< 0.05
Nickel	5	mg/kg	19	5.3	< 5	< 5
Zinc	5	mg/kg	1100	510	21	10
% Moisture	0.1	%	19	22	27	25

Client Sample ID			BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14890	S15-Ja14891	S15-Ja14892	S15-Ja14893
Date Sampled			Jan 27, 2015	Jan 27, 2015	Jan 27, 2015	Jan 27, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	370	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	190	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	560	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	89	88	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	580	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	14	2.0	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	14	2.3	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	14	2.6	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14890	S15-Ja14891	S15-Ja14892	S15-Ja14893
Date Sampled			Jan 27, 2015	Jan 27, 2015	Jan 27, 2015	Jan 27, 2015
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthylene	0.5	mg/kg	1.6	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	2.4	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	10.0	1.6	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	11	1.4	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	10	2.3	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	5.0	0.8	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	8.1	2.0	< 0.5	< 0.5
Chrysene	0.5	mg/kg	8.4	1.2	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	16	3.0	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	4.1	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	1.3	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	7.3	1.4	< 0.5	< 0.5
Pyrene	0.5	mg/kg	16	2.9	< 0.5	< 0.5
Total PAH	0.5	mg/kg	100	17	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	95	105	104	105
p-Terphenyl-d14 (surr.)	1	%	102	121	117	119
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	0.16	-	-	-
4.4'-DDT	0.05	mg/kg	0.24	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	100	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	81	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14890	S15-Ja14891	S15-Ja14892	S15-Ja14893
Date Sampled			Jan 27, 2015	Jan 27, 2015	Jan 27, 2015	Jan 27, 2015
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls (PCB)						
Total PCB	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	100	-	-	-
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	-	-	-
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1	-	-	-
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2-Nitrophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Phenol-d5 (surr.)	1	%	93	-	-	-
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 0.5	-	-	-
Coumaphos	0.5	mg/kg	< 0.5	-	-	-
Demeton (total)	1	mg/kg	< 1	-	-	-
Diazinon	0.5	mg/kg	< 0.5	-	-	-
Dichlorvos	0.5	mg/kg	< 0.5	-	-	-
Dimethoate	0.5	mg/kg	< 0.5	-	-	-
Disulfoton	0.5	mg/kg	< 0.5	-	-	-
Ethoprop	0.5	mg/kg	< 0.5	-	-	-
Fenitrothion	0.5	mg/kg	< 0.5	-	-	-
Fensulfothion	0.5	mg/kg	< 0.5	-	-	-
Fenthion	0.5	mg/kg	< 0.5	-	-	-
Methyl azinphos	0.5	mg/kg	< 0.5	-	-	-
Malathion	0.5	mg/kg	< 0.5	-	-	-
Methyl parathion	0.5	mg/kg	< 0.5	-	-	-
Mevinphos	0.5	mg/kg	< 0.5	-	-	-
Monocrotophos	10	mg/kg	< 10	-	-	-
Parathion	0.5	mg/kg	< 0.5	-	-	-
Phorate	0.5	mg/kg	< 0.5	-	-	-
Profenofos	0.5	mg/kg	< 0.5	-	-	-
Prothiofos	0.5	mg/kg	< 0.5	-	-	-
Ronnel	0.5	mg/kg	< 0.5	-	-	-
Stirophos	0.5	mg/kg	< 0.5	-	-	-
Trichloronate	0.5	mg/kg	< 0.5	-	-	-
Triphenylphosphate (surr.)	1	%	94	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	5.7	7.6	42	11
Cadmium	0.4	mg/kg	1.1	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	25	25	15	9.4
Copper	5	mg/kg	150	14	7.2	16
Lead	5	mg/kg	1500	55	29	31
Mercury	0.05	mg/kg	0.27	0.05	< 0.05	< 0.05
Nickel	5	mg/kg	11	< 5	< 5	< 5
Zinc	5	mg/kg	680	320	15	9.3

Client Sample ID			BH4_0.2	BH4_0.5	BH4_1.0	BH4_1.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14890**	**S15-Ja14891**	**S15-Ja14892**	**S15-Ja14893**
Date Sampled			**Jan 27, 2015**	**Jan 27, 2015**	**Jan 27, 2015**	**Jan 27, 2015**
Test/Reference	LOR	Unit				
% Moisture	0.1	%	23	26	28	24

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite 1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 30, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jan 30, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 30, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 02, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Speciated Phenols	Sydney	Feb 02, 2015	14 Day
- Method: E008 Speciated Phenols			
Metals M8	Sydney	Jan 30, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Eurofins | mgt Suite 15			
Organochlorine Pesticides	Sydney	Jan 30, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Jan 30, 2015	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Organophosphorus Pesticides (OP)	Sydney	Feb 02, 2015	14 Day
- Method: E014 Organophosphorus Pesticides (OP)			
% Moisture	Sydney	Jan 29, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Jan 29, 2015 3:25 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	445748	**Due:**	Feb 5, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GEOTLCOV25176AB				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					Polycyclic Aromatic Hydrocarbons	Metals M8	Speciated Phenols	Eurofins | mgt Suite 15	Eurofins | mgt Suite 1	Moisture Set
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH1_0.2	Jan 28, 2015		Soil	S15-Ja14878	X	X	X	X	X	X
BH1_0.5	Jan 28, 2015		Soil	S15-Ja14879	X	X			X	X
BH1_1.0	Jan 28, 2015		Soil	S15-Ja14880	X	X			X	X
BH1_1.5	Jan 28, 2015		Soil	S15-Ja14881	X	X			X	X
BH2_0.2	Jan 27, 2015		Soil	S15-Ja14882	X	X	X	X	X	X
BH2_0.5	Jan 27, 2015		Soil	S15-Ja14883	X	X			X	X
BH2_1.0	Jan 27, 2015		Soil	S15-Ja14884	X	X			X	X
BH2_1.5	Jan 27, 2015		Soil	S15-Ja14885	X	X			X	X
BH3_0.2	Jan 28, 2015		Soil	S15-Ja14886	X	X	X	X	X	X
BH3_0.5	Jan 28, 2015		Soil	S15-Ja14887	X	X			X	X

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Jan 29, 2015 3:25 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	445748	**Due:**	Feb 5, 2015
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		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GEOTLCOV25176AB				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					Polycyclic Aromatic Hydrocarbons	Metals M8	Speciated Phenols	Eurofins | mgt Suite 15	Eurofins | mgt Suite 1	Moisture Set
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
BH3_1.0	Jan 28, 2015		Soil	S15-Ja14888	X	X			X	X
BH3_1.5	Jan 28, 2015		Soil	S15-Ja14889	X	X			X	X
BH4_0.2	Jan 27, 2015		Soil	S15-Ja14890	X	X	X	X	X	X
BH4_0.5	Jan 27, 2015		Soil	S15-Ja14891	X	X			X	X
BH4_1.0	Jan 27, 2015		Soil	S15-Ja14892	X	X			X	X
BH4_1.5	Jan 27, 2015		Soil	S15-Ja14893	X	X			X	X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
TRH C10-36 (Total)	mg/kg	< 0			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB	mg/kg	< 0			0.5	Pass	
Method Blank							
Speciated Phenols							
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.6-Trichlorophenol	mg/kg	< 0.5			0.5	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.5			0.5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 1			1	Pass	
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2-Nitrophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 0.5			0.5	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides (OP)							
Chlorpyrifos	mg/kg	< 0.5			0.5	Pass	
Coumaphos	mg/kg	< 0.5			0.5	Pass	
Demeton (total)	mg/kg	< 1			1	Pass	
Diazinon	mg/kg	< 0.5			0.5	Pass	
Dichlorvos	mg/kg	< 0.5			0.5	Pass	
Dimethoate	mg/kg	< 0.5			0.5	Pass	
Disulfoton	mg/kg	< 0.5			0.5	Pass	
Ethoprop	mg/kg	< 0.5			0.5	Pass	
Fenitrothion	mg/kg	< 0.5			0.5	Pass	
Fensulfothion	mg/kg	< 0.5			0.5	Pass	
Fenthion	mg/kg	< 0.5			0.5	Pass	
Methyl azinphos	mg/kg	< 0.5			0.5	Pass	
Malathion	mg/kg	< 0.5			0.5	Pass	
Methyl parathion	mg/kg	< 0.5			0.5	Pass	
Mevinphos	mg/kg	< 0.5			0.5	Pass	
Monocrotophos	mg/kg	< 10			10	Pass	
Parathion	mg/kg	< 0.5			0.5	Pass	
Phorate	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Profenofos	mg/kg	< 0.5			0.5	Pass	
Prothiofos	mg/kg	< 0.5			0.5	Pass	
Ronnel	mg/kg	< 0.5			0.5	Pass	
Stirophos	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	90			70-130	Pass	
TRH C10-C14	%	80			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	90			70-130	Pass	
Xylenes - Total	%	90			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	119			70-130	Pass	
TRH C6-C10	%	94			70-130	Pass	
TRH >C10-C16	%	89			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	109			70-130	Pass	
Acenaphthylene	%	100			70-130	Pass	
Anthracene	%	109			70-130	Pass	
Benz(a)anthracene	%	98			70-130	Pass	
Benzo(a)pyrene	%	106			70-130	Pass	
Benzo(b&j)fluoranthene	%	89			70-130	Pass	
Benzo(g.h.i)perylene	%	98			70-130	Pass	
Benzo(k)fluoranthene	%	115			70-130	Pass	
Chrysene	%	112			70-130	Pass	
Dibenz(a.h)anthracene	%	88			70-130	Pass	
Fluoranthene	%	108			70-130	Pass	
Fluorene	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	108			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	113			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	95			70-130	Pass	
4.4'-DDD	%	95			70-130	Pass	
4.4'-DDE	%	95			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDT	%	97			70-130	Pass	
a-BHC	%	100			70-130	Pass	
Aldrin	%	101			70-130	Pass	
b-BHC	%	100			70-130	Pass	
d-BHC	%	100			70-130	Pass	
Dieldrin	%	96			70-130	Pass	
Endosulfan I	%	97			70-130	Pass	
Endosulfan II	%	92			70-130	Pass	
Endosulfan sulphate	%	89			70-130	Pass	
Endrin	%	93			70-130	Pass	
Endrin aldehyde	%	82			70-130	Pass	
Endrin ketone	%	89			70-130	Pass	
g-BHC (Lindane)	%	99			70-130	Pass	
Heptachlor	%	100			70-130	Pass	
Heptachlor epoxide	%	98			70-130	Pass	
Methoxychlor	%	92			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	104			70-130	Pass	
LCS - % Recovery							
Speciated Phenols							
2.4-Dichlorophenol	%	99			30-130	Pass	
2.4-Dimethylphenol	%	79			30-130	Pass	
2.4.5-Trichlorophenol	%	96			30-130	Pass	
2.4.6-Trichlorophenol	%	89			30-130	Pass	
Phenol	%	102			30-130	Pass	
2-Methylphenol (o-Cresol)	%	98			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	99			30-130	Pass	
2-Chlorophenol	%	102			30-130	Pass	
2-Nitrophenol	%	92			30-130	Pass	
4-Chloro-3-methylphenol	%	91			30-130	Pass	
Pentachlorophenol	%	80			30-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides (OP)							
Coumaphos	%	104			70-130	Pass	
Diazinon	%	113			70-130	Pass	
Fenitrothion	%	115			70-130	Pass	
Methyl azinphos	%	91			70-130	Pass	
Malathion	%	113			70-130	Pass	
Phorate	%	95			70-130	Pass	
Stirophos	%	106			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	109			70-130	Pass	
Cadmium	%	112			70-130	Pass	
Chromium	%	109			70-130	Pass	
Copper	%	105			70-130	Pass	
Lead	%	108			70-130	Pass	
Mercury	%	109			70-130	Pass	
Nickel	%	109			70-130	Pass	
Zinc	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organophosphorus Pesticides (OP)				Result 1					
Coumaphos	S15-Ja12653	NCP	%	108			70-130	Pass	
Diazinon	S15-Ja12653	NCP	%	111			70-130	Pass	
Fenitrothion	S15-Ja12653	NCP	%	112			70-130	Pass	
Methyl azinphos	S15-Ja12653	NCP	%	92			70-130	Pass	
Malathion	S15-Ja12653	NCP	%	111			70-130	Pass	
Phorate	S15-Ja12653	NCP	%	88			70-130	Pass	
Stirophos	S15-Ja12653	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-Ja14879	CP	%	76			70-130	Pass	
TRH C10-C14	S15-Ja14879	CP	%	78			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Ja14879	CP	%	83			70-130	Pass	
Toluene	S15-Ja14879	CP	%	78			70-130	Pass	
Ethylbenzene	S15-Ja14879	CP	%	74			70-130	Pass	
m&p-Xylenes	S15-Ja14879	CP	%	76			70-130	Pass	
o-Xylene	S15-Ja14879	CP	%	75			70-130	Pass	
Xylenes - Total	S15-Ja14879	CP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-Ja14879	CP	%	98			70-130	Pass	
TRH C6-C10	S15-Ja14879	CP	%	79			70-130	Pass	
TRH >C10-C16	S15-Ja14879	CP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-Ja14879	CP	%	112			70-130	Pass	
Acenaphthylene	S15-Ja14879	CP	%	103			70-130	Pass	
Anthracene	S15-Ja14879	CP	%	114			70-130	Pass	
Benz(a)anthracene	S15-Ja14879	CP	%	124			70-130	Pass	
Benzo(a)pyrene	S15-Ja14879	CP	%	111			70-130	Pass	
Benzo(b&j)fluoranthene	S15-Ja14879	CP	%	117			70-130	Pass	
Benzo(g.h.i)perylene	S15-Ja14879	CP	%	100			70-130	Pass	
Benzo(k)fluoranthene	S15-Ja14879	CP	%	114			70-130	Pass	
Chrysene	S15-Ja14879	CP	%	109			70-130	Pass	
Dibenz(a.h)anthracene	S15-Ja14879	CP	%	93			70-130	Pass	
Fluoranthene	S15-Ja14879	CP	%	116			70-130	Pass	
Fluorene	S15-Ja14879	CP	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-Ja14879	CP	%	97			70-130	Pass	
Naphthalene	S15-Ja14879	CP	%	111			70-130	Pass	
Phenanthrene	S15-Ja14879	CP	%	108			70-130	Pass	
Pyrene	S15-Ja14879	CP	%	117			70-130	Pass	
Spike - % Recovery									
Speciated Phenols				Result 1					
2.4-Dichlorophenol	S15-Ja14879	CP	%	100			30-130	Pass	
2.4-Dimethylphenol	S15-Ja14879	CP	%	91			30-130	Pass	
2.4.5-Trichlorophenol	S15-Ja14879	CP	%	89			30-130	Pass	
2.4.6-Trichlorophenol	S15-Ja14879	CP	%	100			30-130	Pass	
Phenol	S15-Ja14879	CP	%	114			30-130	Pass	
2-Methylphenol (o-Cresol)	S15-Ja14879	CP	%	102			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Ja14879	CP	%	103			30-130	Pass	
2-Chlorophenol	S15-Ja14879	CP	%	105			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Nitrophenol	S15-Ja14879	CP	%	98			30-130	Pass	
4-Chloro-3-methylphenol	S15-Ja14879	CP	%	93			30-130	Pass	
Pentachlorophenol	S15-Ja14879	CP	%	121			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-Ja14879	CP	%	86			70-130	Pass	
Cadmium	S15-Ja14879	CP	%	109			70-130	Pass	
Copper	S15-Ja14879	CP	%	99			70-130	Pass	
Lead	S15-Ja14879	CP	%	101			70-130	Pass	
Mercury	S15-Ja14879	CP	%	96			70-130	Pass	
Nickel	S15-Ja14879	CP	%	101			70-130	Pass	
Zinc	S15-Ja14879	CP	%	100			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S15-Ja14882	CP	%	110			70-130	Pass	
4.4'-DDD	S15-Ja14882	CP	%	128			70-130	Pass	
4.4'-DDE	S15-Ja14882	CP	%	118			70-130	Pass	
4.4'-DDT	S15-Ja14882	CP	%	87			70-130	Pass	
a-BHC	S15-Ja14882	CP	%	113			70-130	Pass	
Aldrin	S15-Ja14882	CP	%	127			70-130	Pass	
b-BHC	S15-Ja14882	CP	%	111			70-130	Pass	
d-BHC	S15-Ja14882	CP	%	115			70-130	Pass	
Dieldrin	S15-Ja14882	CP	%	116			70-130	Pass	
Endosulfan I	S15-Ja14882	CP	%	108			70-130	Pass	
Endosulfan II	S15-Ja14882	CP	%	104			70-130	Pass	
Endosulfan sulphate	S15-Ja14882	CP	%	94			70-130	Pass	
Endrin	S15-Ja14882	CP	%	104			70-130	Pass	
Endrin aldehyde	S15-Ja14882	CP	%	86			70-130	Pass	
Endrin ketone	S15-Ja14882	CP	%	97			70-130	Pass	
g-BHC (Lindane)	S15-Ja14882	CP	%	111			70-130	Pass	
Heptachlor	S15-Ja14882	CP	%	110			70-130	Pass	
Heptachlor epoxide	S15-Ja14882	CP	%	112			70-130	Pass	
Methoxychlor	S15-Ja14882	CP	%	88			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S15-Ja14882	CP	%	70			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-Ja14889	CP	%	81			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Ja14889	CP	%	88			70-130	Pass	
Toluene	S15-Ja14889	CP	%	85			70-130	Pass	
Ethylbenzene	S15-Ja14889	CP	%	84			70-130	Pass	
m&p-Xylenes	S15-Ja14889	CP	%	85			70-130	Pass	
o-Xylene	S15-Ja14889	CP	%	84			70-130	Pass	
Xylenes - Total	S15-Ja14889	CP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-Ja14889	CP	%	89			70-130	Pass	
TRH C6-C10	S15-Ja14889	CP	%	74			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-Ja14889	CP	%	110			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	S15-Ja14889	CP	%	104			70-130	Pass	
Anthracene	S15-Ja14889	CP	%	113			70-130	Pass	
Benz(a)anthracene	S15-Ja14889	CP	%	112			70-130	Pass	
Benzo(a)pyrene	S15-Ja14889	CP	%	121			70-130	Pass	
Benzo(b&j)fluoranthene	S15-Ja14889	CP	%	125			70-130	Pass	
Benzo(g.h.i)perylene	S15-Ja14889	CP	%	111			70-130	Pass	
Benzo(k)fluoranthene	S15-Ja14889	CP	%	118			70-130	Pass	
Chrysene	S15-Ja14889	CP	%	124			70-130	Pass	
Dibenz(a.h)anthracene	S15-Ja14889	CP	%	88			70-130	Pass	
Fluoranthene	S15-Ja14889	CP	%	105			70-130	Pass	
Fluorene	S15-Ja14889	CP	%	106			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-Ja14889	CP	%	103			70-130	Pass	
Naphthalene	S15-Ja14889	CP	%	110			70-130	Pass	
Phenanthrene	S15-Ja14889	CP	%	109			70-130	Pass	
Pyrene	S15-Ja14889	CP	%	111			70-130	Pass	
Spike - % Recovery									
Speciated Phenols				Result 1					
2.4-Dichlorophenol	S15-Ja14889	CP	%	96			30-130	Pass	
2.4-Dimethylphenol	S15-Ja14889	CP	%	92			30-130	Pass	
2.4.5-Trichlorophenol	S15-Ja14889	CP	%	86			30-130	Pass	
2.4.6-Trichlorophenol	S15-Ja14889	CP	%	92			30-130	Pass	
Phenol	S15-Ja14889	CP	%	104			30-130	Pass	
2-Methylphenol (o-Cresol)	S15-Ja14889	CP	%	97			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Ja14889	CP	%	99			30-130	Pass	
2-Chlorophenol	S15-Ja14889	CP	%	99			30-130	Pass	
2-Nitrophenol	S15-Ja14889	CP	%	92			30-130	Pass	
4-Chloro-3-methylphenol	S15-Ja14889	CP	%	90			30-130	Pass	
Pentachlorophenol	S15-Ja14889	CP	%	115			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-Ja14889	CP	%	94			70-130	Pass	
Cadmium	S15-Ja14889	CP	%	105			70-130	Pass	
Chromium	S15-Ja14889	CP	%	107			70-130	Pass	
Copper	S15-Ja14889	CP	%	103			70-130	Pass	
Mercury	S15-Ja14889	CP	%	111			70-130	Pass	
Nickel	S15-Ja14889	CP	%	104			70-130	Pass	
Zinc	S15-Ja14889	CP	%	128			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S15-Ja14890	CP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-Ja14890	CP	%	93			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-Ja14878	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-Ja14878	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-Ja14878	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-Ja14878	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-Ja14878	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-Ja14878	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-Ja14878	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-Ja14878	CP	mg/kg	0.9	0.9	3.0	30%	Pass	
TRH C6-C10	S15-Ja14878	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	S15-Ja14878	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-Ja14878	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-Ja14878	CP	mg/kg	0.17	0.15	15	30%	Pass	
4.4'-DDT	S15-Ja14878	CP	mg/kg	0.27	0.23	19	30%	Pass	
a-BHC	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-Ja14878	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-Ja14878	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-Ja14878	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S15-Ja14878	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S15-Ja14878	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S15-Ja14878	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S15-Ja14878	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S15-Ja14878	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S15-Ja14878	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides (OP)				Result 1	Result 2	RPD			
Chlorpyrifos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Coumaphos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Demeton (total)	S15-Ja14980	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Diazinon	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorvos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dimethoate	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Disulfoton	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethoprop	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fenitrothion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fensulfothion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fenthion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methyl azinphos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Malathion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methyl parathion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mevinphos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Monocrotophos	S15-Ja14980	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Parathion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phorate	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides (OP)				Result 1	Result 2	RPD			
Profenofos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Prothiofos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ronnel	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Stirophos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-Ja14878	CP	mg/kg	28	24	15	30%	Pass	
Cadmium	S15-Ja14878	CP	mg/kg	2.2	1.8	21	30%	Pass	
Chromium	S15-Ja14878	CP	mg/kg	25	21	19	30%	Pass	
Copper	S15-Ja14878	CP	mg/kg	110	110	<1	30%	Pass	
Lead	S15-Ja14878	CP	mg/kg	1300	1200	9.0	30%	Pass	
Mercury	S15-Ja14878	CP	mg/kg	0.58	0.64	10	30%	Pass	
Nickel	S15-Ja14878	CP	mg/kg	12	9.6	25	30%	Pass	
Zinc	S15-Ja14442	NCP	mg/kg	78	89	13	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-Ja14878	CP	%	22	22	6.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-Ja14888	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S15-Ja14888	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-Ja14888	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-Ja14888	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-Ja14888	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-Ja14888	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-Ja14888	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-Ja14888	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-Ja14888	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-Ja14888	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S15-Ja14888	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	S15-Ja14888	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S15-Ja14888	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-Ja14888	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-Ja14888	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Naphthalene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2.4-Dichlorophenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dimethylphenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.6-Trichlorophenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Ja14888	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2-Chlorophenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Nitrophenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S15-Ja14888	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pentachlorophenol	S15-Ja14888	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-Ja14888	CP	mg/kg	5.9	7.9	29	30%	Pass	
Cadmium	S15-Ja14888	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S15-Ja14888	CP	mg/kg	7.8	7.5	3.0	30%	Pass	
Copper	S15-Ja14888	CP	mg/kg	13	11	15	30%	Pass	
Lead	S15-Ja14888	CP	mg/kg	68	51	29	30%	Pass	
Mercury	S15-Ja14888	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S15-Ja14888	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-Ja14888	CP	%	27	27	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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coffey

Chain of Custody

No: 07262

Laboratory Quotation / Order No:

Job No: GT25076AB

Sheet 1 of 1

Dispatch to: (Address & Phone No.) Eurofins MGT	Sampled by: MATTHEW BARRY	Consigning Officer: Date Dispatched: 29/1/15
Attention:	Project Manager: (report results to) MATTHEW LOCKE	Courier Service: Consignment Note No: #445784

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
MATTHEW BARRY	29/1/15		PARESH		

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TRHs	MAHs = BTEX	Metals:	B15	Phenols	B1	M8	PAH	BTEX						Sample Condition on Receipt
	SOIL	1J, 1Zip	HA1	28/1/15					✓	✓	✓	✓	✓							
	↓	↓	2	↓					✓	✓	✓	✓	✓							
			3						✓	✓	✓	✓	✓							
			4						✓	✓	✓	✓	✓							
			5						✓	✓	✓	✓	✓							
			6						✓	✓	✓	✓	✓							
			7						✓	✓	✓	✓	✓							
			8						✓	✓	✓	✓	✓							
		↓	9						✓	✓	✓	✓	✓							
		1J	QC1						✓	✓	✓	✓	✓							
		↓	QC2						✓	✓	✓	✓	✓							
		↓	QC2A						✓	✓	✓	✓	✓							
		1✓	TB1											✓						
	↓	↓	TS1											✓						
	Water	2A, 2✓	RB1	↓							✓	✓								

Special Laboratory Instructions:

Detection Limits:

Turnaround Required:

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

29 JAN 2015 15:25

From: Matthew Barry [mailto:Matt.Barry@coffey.com]

Sent: Monday, 2 February 2015 11:09 AM

To: EnviroSampleNSW

Subject: Forward sample QC2A to ALS

Hi Sean,

Can you please forward the sample QC2A to ALS for Analysis from the job number GT25176, associated with sample HA1 through HA9.

Thanks,

Matthew Barry

Environmental Scientist

Level 19, Tower B,

799 Pacific Highway

Chatswood NSW 2067

t: 02 9406 1000

m: 0427 934 988

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eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	GT25076AB
COC number:	07262
Turn around time:	5 Day
Date/Time received:	Jan 29, 2015 3:25 PM
Eurofins | mgt reference:	**445754**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 14.5 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (02) 4965 4492 or by e.mail: AndrewBlack@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

eurofins | mgt

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Locke**

Report **445754-S**
Project name GT25076AB
Received Date Jan 29, 2015

Client Sample ID			**HA1**	**HA2**	**HA3**	**HA4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14899**	**S15-Ja14900**	**S15-Ja14901**	**S15-Ja14902**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	390	< 50	2300	1200
TRH C29-C36	50	mg/kg	360	< 50	1100	970
TRH C10-36 (Total)	50	mg/kg	750	< 50	3400	2200
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	89	85	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	93	54
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	93	54
TRH >C16-C34	100	mg/kg	680	< 100	3200	2000
TRH >C34-C40	100	mg/kg	210	< 100	640	530
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	20	1.3	54	61
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	20	1.6	54	61
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	20	1.9	54	61
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	1.3	< 0.5	4.3	6.6
Anthracene	0.5	mg/kg	1.8	< 0.5	5.1	8.9
Benz(a)anthracene	0.5	mg/kg	13	1.1	40	47
Benzo(a)pyrene	0.5	mg/kg	15	1.0	40	42
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	13	0.9	30	21
Benzo(g.h.i)perylene	0.5	mg/kg	8.1	< 0.5	24	25
Benzo(k)fluoranthene	0.5	mg/kg	12	0.9	29	33
Chrysene	0.5	mg/kg	11	0.9	29	29
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	1.5	6.2
Fluoranthene	0.5	mg/kg	16	1.5	37	46

Client Sample ID			HA1	HA2	HA3	HA4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14899	S15-Ja14900	S15-Ja14901	S15-Ja14902
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	< 0.5	0.8	3.4
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	6.4	< 0.5	18	20
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	1.7	6.9
Phenanthrene	0.5	mg/kg	5.5	0.7	14	30
Pyrene	0.5	mg/kg	16	1.4	38	44
Total PAH	0.5	mg/kg	120	8.4	310	370
2-Fluorobiphenyl (surr.)	1	%	95	94	102	99
p-Terphenyl-d14 (surr.)	1	%	111	103	108	107
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.073	< 0.05	< 0.05	< 0.072
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	0.22	< 0.05	0.21	< 0.12
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	116	119	98	120
Tetrachloro-m-xylene (surr.)	1	%	115	95	97	95
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	116	119	98	120
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			HA1	HA2	HA3	HA4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14899	S15-Ja14900	S15-Ja14901	S15-Ja14902
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Speciated Phenols						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	94	88	94	91
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.7
Coumaphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Demeton (total)	1	mg/kg	< 1	< 1	< 1	< 1
Diazinon	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorvos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dimethoate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Disulfoton	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fenitrothion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fensulfothion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fenthion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Methyl azinphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Malathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Methyl parathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mevinphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Monocrotophos	10	mg/kg	< 10	< 10	< 10	< 10
Parathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phorate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Profenofos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Prothiofos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ronnel	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Stirophos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichloronate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Triphenylphosphate (surr.)	1	%	81	102	103	105
Heavy Metals						
Arsenic	2	mg/kg	9.3	7.0	9.8	12
Cadmium	0.4	mg/kg	0.8	0.5	1.2	1.5
Chromium	5	mg/kg	72	9.2	29	28
Copper	5	mg/kg	120	30	230	230
Lead	5	mg/kg	4200	260	4300	2100
Mercury	0.05	mg/kg	1.2	0.13	0.80	1.3
Nickel	5	mg/kg	8.0	< 5	12	15
Zinc	5	mg/kg	810	250	1300	950
% Moisture	0.1	%	21	20	27	30

Client Sample ID			HA5	HA6	HA7	HA8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14903	S15-Ja14904	S15-Ja14905	S15-Ja14906
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	21	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	1500	920	490	400
TRH C29-C36	50	mg/kg	970	440	110	160
TRH C10-36 (Total)	50	mg/kg	2500	1400	600	560
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	91	89	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	1.5	2.2	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	53	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	52	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	2300	1300	590	530
TRH >C34-C40	100	mg/kg	500	220	< 100	200
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	110	37	24	19
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	110	37	24	19
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	110	37	24	20
Acenaphthene	0.5	mg/kg	1.0	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	11	4.4	2.8	2.4
Anthracene	0.5	mg/kg	22	8.8	5.4	4.1
Benz(a)anthracene	0.5	mg/kg	67	31	19	16
Benzo(a)pyrene	0.5	mg/kg	68	27	18	14
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	100	27	12	11
Benzo(g.h.i)perylene	0.5	mg/kg	38	13	8.2	7.2
Benzo(k)fluoranthene	0.5	mg/kg	88	19	14	12
Chrysene	0.5	mg/kg	50	21	15	12
Dibenz(a.h)anthracene	0.5	mg/kg	12	1.1	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	83	41	29	21
Fluorene	0.5	mg/kg	8.5	2.7	1.3	1.0
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	32	11	6.6	6.0
Naphthalene	0.5	mg/kg	4.9	1.5	0.8	< 0.5
Phenanthrene	0.5	mg/kg	65	29	19	13
Pyrene	0.5	mg/kg	79	40	28	20
Total PAH	0.5	mg/kg	730	280	180	140
2-Fluorobiphenyl (surr.)	1	%	98	94	100	106
p-Terphenyl-d14 (surr.)	1	%	113	105	107	114
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.66	< 0.094	< 0.05	< 0.05

Client Sample ID			HA5	HA6	HA7	HA8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14903	S15-Ja14904	S15-Ja14905	S15-Ja14906
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Dibutylchlorendate (surr.)	1	%	123	110	107	120
Tetrachloro-m-xylene (surr.)	1	%	88	88	93	109
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	123	110	107	120
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1	< 1	< 1	< 1
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	95	94	93	101
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 1.7	< 1.8	< 0.5	< 0.6
Coumaphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Demeton (total)	1	mg/kg	< 1	< 1	< 1	< 1
Diazinon	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorvos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dimethoate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Disulfoton	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			HA5	HA6	HA7	HA8
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14903**	**S15-Ja14904**	**S15-Ja14905**	**S15-Ja14906**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides (OP)						
Ethoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fenitrothion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fensulfothion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fenthion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Methyl azinphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Malathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Methyl parathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mevinphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Monocrotophos	10	mg/kg	< 10	< 10	< 10	< 10
Parathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phorate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Profenofos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Prothiofos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ronnel	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Stirophos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichloronate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Triphenylphosphate (surr.)	1	%	117	99	103	100
Heavy Metals						
Arsenic	2	mg/kg	13	4.7	4.9	5.1
Cadmium	0.4	mg/kg	3.1	< 0.4	0.5	0.6
Chromium	5	mg/kg	31	18	11	35
Copper	5	mg/kg	270	29	34	81
Lead	5	mg/kg	3700	330	310	540
Mercury	0.05	mg/kg	0.67	0.22	0.29	0.19
Nickel	5	mg/kg	16	9.9	7.0	19
Zinc	5	mg/kg	1400	400	590	630
% Moisture	0.1	%	28	17	21	28

Client Sample ID			HA9	QC1	QC2	TB1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14907**	**S15-Ja14908**	**S15-Ja14909**	**S15-Ja14911**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	24	< 20	22	-
TRH C15-C28	50	mg/kg	550	230	1200	-
TRH C29-C36	50	mg/kg	210	110	360	-
TRH C10-36 (Total)	50	mg/kg	780	340	1600	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85	83	88	90

Client Sample ID			HA9	QC1	QC2	TB1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14907	S15-Ja14908	S15-Ja14909	S15-Ja14911
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	1.0	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	730	340	1500	-
TRH >C34-C40	100	mg/kg	200	< 100	440	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	23	15	56	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	23	15	56	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	24	15	56	-
Acenaphthene	0.5	mg/kg	0.7	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	4.2	0.8	5.2	-
Anthracene	0.5	mg/kg	5.4	1.2	8.9	-
Benz(a)anthracene	0.5	mg/kg	14	7.6	44	-
Benzo(a)pyrene	0.5	mg/kg	18	11	41	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	17	11	34	-
Benzo(g.h.i)perylene	0.5	mg/kg	6.6	5.3	19	-
Benzo(k)fluoranthene	0.5	mg/kg	14	8.7	36	-
Chrysene	0.5	mg/kg	13	7.6	32	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	1.3	1.5	-
Fluoranthene	0.5	mg/kg	21	11	50	-
Fluorene	0.5	mg/kg	3.5	< 0.5	3.0	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	5.7	4.1	17	-
Naphthalene	0.5	mg/kg	1.0	< 0.5	2.9	-
Phenanthrene	0.5	mg/kg	17	4.0	29	-
Pyrene	0.5	mg/kg	18	10	49	-
Total PAH	0.5	mg/kg	160	84	370	-
2-Fluorobiphenyl (surr.)	1	%	76	88	99	-
p-Terphenyl-d14 (surr.)	1	%	83	98	109	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	0.6	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.14	< 0.065	< 0.22	-
4.4'-DDE	0.05	mg/kg	0.23	0.11	< 0.05	-
4.4'-DDT	0.05	mg/kg	0.32	0.13	0.15	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	0.19	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-

Client Sample ID			HA9	QC1	QC2	TB1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S15-Ja14907	S15-Ja14908	S15-Ja14909	S15-Ja14911
Date Sampled			Jan 28, 2015	Jan 28, 2015	Jan 28, 2015	Jan 28, 2015
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	< 1	< 1	< 1	-
Dibutylchlorendate (surr.)	1	%	114	101	117	-
Tetrachloro-m-xylene (surr.)	1	%	99	76	111	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PCB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	114	101	117	-
Speciated Phenols						
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2.4.6-Trichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Methylphenol (o-Cresol)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
3&4-Methylphenol (m&p-Cresol)	1	mg/kg	< 1	< 1	< 1	-
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Nitrophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	-
Phenol-d5 (surr.)	1	%	73	85	97	-
Organophosphorus Pesticides (OP)						
Chlorpyrifos	0.5	mg/kg	< 1.3	< 0.5	< 1.1	-
Coumaphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Demeton (total)	1	mg/kg	< 1	< 1	< 1	-
Diazinon	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dichlorvos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dimethoate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Disulfoton	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Ethoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fenitrothion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fensulfothion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fenthion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Methyl azinphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Malathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Methyl parathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Mevinphos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Monocrotophos	10	mg/kg	< 10	< 10	< 10	-
Parathion	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phorate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Profenofos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Prothiofos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Ronnel	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID			HA9	QC1	QC2	TB1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Ja14907**	**S15-Ja14908**	**S15-Ja14909**	**S15-Ja14911**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides (OP)						
Stirophos	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Trichloronate	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Triphenylphosphate (surr.)	1	%	98	97	109	-
Heavy Metals						
Arsenic	2	mg/kg	16	8.6	12	-
Cadmium	0.4	mg/kg	1.6	0.7	1.8	-
Chromium	5	mg/kg	21	19	23	-
Copper	5	mg/kg	160	120	160	-
Lead	5	mg/kg	1400	2700	3200	-
Mercury	0.05	mg/kg	0.76	0.73	0.45	-
Nickel	5	mg/kg	12	7.8	15	-
Zinc	5	mg/kg	930	680	1300	-
% Moisture	0.1	%	21	19	25	-

Client Sample ID			TS1
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S15-Ja14912**
Date Sampled			**Jan 28, 2015**
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.1	mg/kg	66%
Toluene	0.1	mg/kg	67%
Ethylbenzene	0.1	mg/kg	66%
m&p-Xylenes	0.2	mg/kg	67%
o-Xylene	0.1	mg/kg	66%
Xylenes - Total	0.3	mg/kg	67%
4-Bromofluorobenzene (surr.)	1	%	93

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite 1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Feb 02, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jan 30, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 02, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 02, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Speciated Phenols	Sydney	Feb 02, 2015	14 Day
- Method: E008 Speciated Phenols			
Metals M8	Sydney	Jan 30, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Eurofins | mgt Suite 15			
Organochlorine Pesticides	Sydney	Feb 02, 2015	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Feb 02, 2015	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Organophosphorus Pesticides (OP)	Sydney	Feb 02, 2015	14 Day
- Method: E014 Organophosphorus Pesticides (OP)			
% Moisture	Sydney	Jan 29, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Jan 29, 2015 3:25 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	445754	**Due:**	Feb 5, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GT25076AB				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Speciated Phenols	Eurofins | mgt Suite 15	Eurofins | mgt Suite 1	Moisture Set
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
HA1	Jan 28, 2015		Soil	S15-Ja14899		X	X		X	X	X	X
HA2	Jan 28, 2015		Soil	S15-Ja14900		X	X		X	X	X	X
HA3	Jan 28, 2015		Soil	S15-Ja14901		X	X		X	X	X	X
HA4	Jan 28, 2015		Soil	S15-Ja14902		X	X		X	X	X	X
HA5	Jan 28, 2015		Soil	S15-Ja14903		X	X		X	X	X	X
HA6	Jan 28, 2015		Soil	S15-Ja14904		X	X		X	X	X	X
HA7	Jan 28, 2015		Soil	S15-Ja14905		X	X		X	X	X	X
HA8	Jan 28, 2015		Soil	S15-Ja14906		X	X		X	X	X	X
HA9	Jan 28, 2015		Soil	S15-Ja14907		X	X		X	X	X	X
QC1	Jan 28, 2015		Soil	S15-Ja14908		X	X		X	X	X	X

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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Project Name:	GT25076AB				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Speciated Phenols	Eurofins | mgt Suite 15	Eurofins | mgt Suite 1	Moisture Set
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
QC2	Jan 28, 2015		Soil	S15-Ja14909		X	X		X	X	X	X
QC2A	Jan 28, 2015		Soil	S15-Ja14910	X							
TB1	Jan 28, 2015		Soil	S15-Ja14911				X				
TS1	Jan 28, 2015		Soil	S15-Ja14912				X				
R1	Jan 28, 2015		Water	S15-Ja14914			X				X	

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
TRH C10-36 (Total)	mg/kg	< 0			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Speciated Phenols							
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.6-Trichlorophenol	mg/kg	< 0.5			0.5	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.5			0.5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 1			1	Pass	
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2-Nitrophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 0.5			0.5	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides (OP)							
Chlorpyrifos	mg/kg	< 0.5			0.5	Pass	
Coumaphos	mg/kg	< 0.5			0.5	Pass	
Demeton (total)	mg/kg	< 1			1	Pass	
Diazinon	mg/kg	< 0.5			0.5	Pass	
Dichlorvos	mg/kg	< 0.5			0.5	Pass	
Dimethoate	mg/kg	< 0.5			0.5	Pass	
Disulfoton	mg/kg	< 0.5			0.5	Pass	
Ethoprop	mg/kg	< 0.5			0.5	Pass	
Fenitrothion	mg/kg	< 0.5			0.5	Pass	
Fensulfothion	mg/kg	< 0.5			0.5	Pass	
Fenthion	mg/kg	< 0.5			0.5	Pass	
Methyl azinphos	mg/kg	< 0.5			0.5	Pass	
Malathion	mg/kg	< 0.5			0.5	Pass	
Methyl parathion	mg/kg	< 0.5			0.5	Pass	
Mevinphos	mg/kg	< 0.5			0.5	Pass	
Monocrotophos	mg/kg	< 10			10	Pass	
Parathion	mg/kg	< 0.5			0.5	Pass	
Phorate	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Profenofos	mg/kg	< 0.5			0.5	Pass	
Prothiofos	mg/kg	< 0.5			0.5	Pass	
Ronnel	mg/kg	< 0.5			0.5	Pass	
Stirophos	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	89			70-130	Pass	
TRH C10-C14	%	74			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	92			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	87			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
o-Xylene	%	87			70-130	Pass	
Xylenes - Total	%	88			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	101			70-130	Pass	
TRH C6-C10	%	83			70-130	Pass	
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	99			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	118			70-130	Pass	
Benzo(b&j)fluoranthene	%	103			70-130	Pass	
Benzo(g.h.i)perylene	%	78			70-130	Pass	
Benzo(k)fluoranthene	%	120			70-130	Pass	
Chrysene	%	117			70-130	Pass	
Dibenz(a.h)anthracene	%	79			70-130	Pass	
Fluoranthene	%	98			70-130	Pass	
Fluorene	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	80			70-130	Pass	
Naphthalene	%	99			70-130	Pass	
Phenanthrene	%	93			70-130	Pass	
Pyrene	%	102			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	95			70-130	Pass	
4.4'-DDD	%	103			70-130	Pass	
4.4'-DDE	%	94			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDT	%	90			70-130	Pass	
a-BHC	%	96			70-130	Pass	
Aldrin	%	96			70-130	Pass	
b-BHC	%	98			70-130	Pass	
d-BHC	%	94			70-130	Pass	
Dieldrin	%	97			70-130	Pass	
Endosulfan I	%	96			70-130	Pass	
Endosulfan II	%	99			70-130	Pass	
Endosulfan sulphate	%	97			70-130	Pass	
Endrin	%	98			70-130	Pass	
Endrin aldehyde	%	90			70-130	Pass	
Endrin ketone	%	95			70-130	Pass	
g-BHC (Lindane)	%	97			70-130	Pass	
Heptachlor	%	94			70-130	Pass	
Heptachlor epoxide	%	96			70-130	Pass	
Methoxychlor	%	91			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	120			70-130	Pass	
LCS - % Recovery							
Speciated Phenols							
2.4-Dichlorophenol	%	88			30-130	Pass	
2.4-Dimethylphenol	%	90			30-130	Pass	
2.4.5-Trichlorophenol	%	87			30-130	Pass	
2.4.6-Trichlorophenol	%	82			30-130	Pass	
Phenol	%	94			30-130	Pass	
2-Methylphenol (o-Cresol)	%	94			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	93			30-130	Pass	
2-Chlorophenol	%	94			30-130	Pass	
2-Nitrophenol	%	82			30-130	Pass	
4-Chloro-3-methylphenol	%	84			30-130	Pass	
Pentachlorophenol	%	88			30-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides (OP)							
Coumaphos	%	104			70-130	Pass	
Diazinon	%	113			70-130	Pass	
Fenitrothion	%	115			70-130	Pass	
Methyl azinphos	%	91			70-130	Pass	
Malathion	%	113			70-130	Pass	
Phorate	%	95			70-130	Pass	
Stirophos	%	106			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	109			70-130	Pass	
Cadmium	%	114			70-130	Pass	
Chromium	%	111			70-130	Pass	
Copper	%	112			70-130	Pass	
Lead	%	111			70-130	Pass	
Mercury	%	112			70-130	Pass	
Nickel	%	110			70-130	Pass	
Zinc	%	81			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S15-Fe00392	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-Fe00392	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-Fe00686	NCP	%	114			70-130	Pass	
Acenaphthylene	S15-Fe00686	NCP	%	111			70-130	Pass	
Anthracene	S15-Fe00686	NCP	%	122			70-130	Pass	
Benz(a)anthracene	S15-Fe00686	NCP	%	123			70-130	Pass	
Benzo(a)pyrene	S15-Fe00686	NCP	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	S15-Fe00686	NCP	%	105			70-130	Pass	
Benzo(g.h.i)perylene	S15-Fe00686	NCP	%	76			70-130	Pass	
Benzo(k)fluoranthene	S15-Fe00686	NCP	%	117			70-130	Pass	
Chrysene	S15-Fe00686	NCP	%	124			70-130	Pass	
Dibenz(a.h)anthracene	S15-Fe00686	NCP	%	77			70-130	Pass	
Fluoranthene	S15-Fe00686	NCP	%	106			70-130	Pass	
Fluorene	S15-Fe00686	NCP	%	118			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-Fe00686	NCP	%	77			70-130	Pass	
Naphthalene	S15-Fe00686	NCP	%	120			70-130	Pass	
Phenanthrene	S15-Fe00686	NCP	%	100			70-130	Pass	
Pyrene	S15-Fe00686	NCP	%	115			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S15-Ja14442	NCP	%	100			70-130	Pass	
4.4'-DDD	S15-Ja14442	NCP	%	111			70-130	Pass	
4.4'-DDE	S15-Ja14442	NCP	%	100			70-130	Pass	
4.4'-DDT	S15-Ja14442	NCP	%	96			70-130	Pass	
a-BHC	S15-Ja14442	NCP	%	97			70-130	Pass	
Aldrin	S15-Ja14442	NCP	%	95			70-130	Pass	
b-BHC	S15-Ja14442	NCP	%	101			70-130	Pass	
d-BHC	S15-Ja14442	NCP	%	107			70-130	Pass	
Dieldrin	S15-Ja14442	NCP	%	77			70-130	Pass	
Endosulfan I	S15-Ja14442	NCP	%	99			70-130	Pass	
Endosulfan II	S15-Ja14442	NCP	%	94			70-130	Pass	
Endosulfan sulphate	S15-Ja14442	NCP	%	95			70-130	Pass	
Endrin	S15-Ja14442	NCP	%	110			70-130	Pass	
Endrin aldehyde	S15-Ja14442	NCP	%	89			70-130	Pass	
Endrin ketone	S15-Ja14442	NCP	%	92			70-130	Pass	
g-BHC (Lindane)	S15-Ja14442	NCP	%	102			70-130	Pass	
Heptachlor	S15-Ja14442	NCP	%	101			70-130	Pass	
Heptachlor epoxide	S15-Ja14442	NCP	%	98			70-130	Pass	
Methoxychlor	S15-Ja14442	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S15-Fe00136	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Speciated Phenols				Result 1					
2.4-Dichlorophenol	S15-Fe00686	NCP	%	102			30-130	Pass	
2.4-Dimethylphenol	S15-Fe00686	NCP	%	108			30-130	Pass	
2.4.5-Trichlorophenol	S15-Fe00686	NCP	%	96			30-130	Pass	
2.4.6-Trichlorophenol	S15-Fe00686	NCP	%	96			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenol	S15-Fe00686	NCP	%	112			30-130	Pass	
2-Methylphenol (o-Cresol)	S15-Fe00686	NCP	%	108			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Fe00686	NCP	%	104			30-130	Pass	
2-Chlorophenol	S15-Fe00686	NCP	%	107			30-130	Pass	
2-Nitrophenol	S15-Fe00654	NCP	%	76			30-130	Pass	
4-Chloro-3-methylphenol	S15-Fe00686	NCP	%	97			30-130	Pass	
Pentachlorophenol	S15-Fe00654	NCP	%	77			30-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides (OP)				Result 1					
Coumaphos	S15-Ja12653	NCP	%	108			70-130	Pass	
Diazinon	S15-Ja12653	NCP	%	111			70-130	Pass	
Fenitrothion	S15-Ja12653	NCP	%	112			70-130	Pass	
Methyl azinphos	S15-Ja12653	NCP	%	92			70-130	Pass	
Malathion	S15-Ja12653	NCP	%	111			70-130	Pass	
Phorate	S15-Ja12653	NCP	%	88			70-130	Pass	
Stirophos	S15-Ja12653	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S15-Ja15638	NCP	%	124			70-130	Pass	
Zinc	S15-Ja15638	NCP	%	120			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-Ja14902	CP	%	81			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Ja14902	CP	%	80			70-130	Pass	
Toluene	S15-Ja14902	CP	%	77			70-130	Pass	
Ethylbenzene	S15-Ja14902	CP	%	75			70-130	Pass	
m&p-Xylenes	S15-Ja14902	CP	%	76			70-130	Pass	
o-Xylene	S15-Ja14902	CP	%	75			70-130	Pass	
Xylenes - Total	S15-Ja14902	CP	%	76			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-Ja14902	CP	%	90			70-130	Pass	
TRH C6-C10	S15-Ja14902	CP	%	78			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-Ja14902	CP	%	102			70-130	Pass	
Cadmium	S15-Ja14902	CP	%	102			70-130	Pass	
Chromium	S15-Ja14902	CP	%	95			70-130	Pass	
Copper	S15-Ja14902	CP	%	72			70-130	Pass	
Nickel	S15-Ja14902	CP	%	112			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S15-Fe00391	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-Fe00391	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-Fe00391	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-Fe00391	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-Fe00391	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-Fe00391	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S15-Fe00108	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S15-Fe00108	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S15-Fe00108	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S15-Fe00108	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S15-Fe01522	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S15-Fe01522	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S15-Fe01522	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S15-Fe01522	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S15-Fe01522	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S15-Fe01522	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2.4-Dichlorophenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dimethylphenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.6-Trichlorophenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2-Methylphenol (o-Cresol)	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S15-Fe00680	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
2-Chlorophenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Nitrophenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S15-Fe00680	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pentachlorophenol	S15-Fe00680	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides (OP)				Result 1	Result 2	RPD			
Chlorpyrifos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Coumaphos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Demeton (total)	S15-Ja14980	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Diazinon	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorvos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dimethoate	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Disulfoton	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethoprop	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fenitrothion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fensulfothion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fenthion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methyl azinphos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Malathion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methyl parathion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mevinphos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Monocrotophos	S15-Ja14980	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Parathion	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phorate	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Profenofos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Prothiofos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ronnel	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Stirophos	S15-Ja14980	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-Ja14899	CP	%	21	20	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-Ja14901	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-Ja14901	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-Ja14901	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S15-Ja14901	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-Ja14901	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-Ja14901	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-Ja14901	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-Ja14901	CP	mg/kg	0.5	0.6	19	30%	Pass	
TRH C6-C10	S15-Ja14901	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	S15-Ja14901	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-Ja14901	CP	mg/kg	9.8	12	17	30%	Pass	
Cadmium	S15-Ja14901	CP	mg/kg	1.2	1.4	11	30%	Pass	Q15
Chromium	S15-Ja14901	CP	mg/kg	29	26	9.0	30%	Pass	
Lead	S15-Ja14901	CP	mg/kg	4300	5600	26	30%	Pass	
Mercury	S15-Ja14901	CP	mg/kg	0.80	0.61	27	30%	Pass	
Nickel	S15-Ja14901	CP	mg/kg	12	15	19	30%	Pass	Q15
Zinc	S15-Ja14901	CP	mg/kg	1300	1500	18	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S15-Ja14902	CP	%	30	28	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's Acceptance Criteria as stipulated in SOP 05. Refer to Glossary Page of this report for further details

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Locke**

Report **445754-W**
Project name GT25076AB
Received Date Jan 29, 2015

Client Sample ID			**R1**
Sample Matrix			**Water**
Eurofins | mgt Sample No.			**S15-Ja14914**
Date Sampled			**Jan 28, 2015**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.02	mg/L	< 0.02
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Heavy Metals			
Arsenic	0.005	mg/L	< 0.005
Cadmium	0.0005	mg/L	< 0.0005
Chromium	0.005	mg/L	< 0.005
Copper	0.005	mg/L	< 0.005
Lead	0.005	mg/L	< 0.005
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.005	mg/L	< 0.005
Zinc	0.005	mg/L	< 0.005

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite 1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 29, 2015	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jan 29, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 29, 2015	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	Jan 29, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Jan 29, 2015 3:25 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	445754	**Due:**	Feb 5, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GT25076AB				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Speciated Phenols	Eurofins | mgt Suite 15	Eurofins | mgt Suite 1	Moisture Set
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
HA1	Jan 28, 2015		Soil	S15-Ja14899		X	X		X	X	X	X
HA2	Jan 28, 2015		Soil	S15-Ja14900		X	X		X	X	X	X
HA3	Jan 28, 2015		Soil	S15-Ja14901		X	X		X	X	X	X
HA4	Jan 28, 2015		Soil	S15-Ja14902		X	X		X	X	X	X
HA5	Jan 28, 2015		Soil	S15-Ja14903		X	X		X	X	X	X
HA6	Jan 28, 2015		Soil	S15-Ja14904		X	X		X	X	X	X
HA7	Jan 28, 2015		Soil	S15-Ja14905		X	X		X	X	X	X
HA8	Jan 28, 2015		Soil	S15-Ja14906		X	X		X	X	X	X
HA9	Jan 28, 2015		Soil	S15-Ja14907		X	X		X	X	X	X
QC1	Jan 28, 2015		Soil	S15-Ja14908		X	X		X	X	X	X

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
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Project Name:	GT25076AB				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					CANCELLED	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Speciated Phenols	Eurofins | mgt Suite 15	Eurofins | mgt Suite 1	Moisture Set
Laboratory where analysis is conducted												
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
External Laboratory												
QC2	Jan 28, 2015		Soil	S15-Ja14909		X	X		X	X	X	X
QC2A	Jan 28, 2015		Soil	S15-Ja14910	X							
TB1	Jan 28, 2015		Soil	S15-Ja14911				X				
TS1	Jan 28, 2015		Soil	S15-Ja14912				X				
R1	Jan 28, 2015		Water	S15-Ja14914			X				X	

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH C6-C10 less BTEX (F1)	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.005			0.005	Pass	
Cadmium	mg/L	< 0.0005			0.0005	Pass	
Chromium	mg/L	< 0.005			0.005	Pass	
Copper	mg/L	< 0.005			0.005	Pass	
Lead	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.005			0.005	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	104			70-130	Pass	
TRH C10-C14	%	89			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	104			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	103			70-130	Pass	
m&p-Xylenes	%	103			70-130	Pass	
o-Xylene	%	103			70-130	Pass	
Xylenes - Total	%	103			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	114			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
TRH >C10-C16	%	99			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	92			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium			%	92			70-130	Pass	
Chromium			%	90			70-130	Pass	
Copper			%	90			70-130	Pass	
Lead			%	87			70-130	Pass	
Mercury			%	86			70-130	Pass	
Nickel			%	89			70-130	Pass	
Zinc			%	86			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-Ja14924	NCP	%	99			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Ja14924	NCP	%	100			70-130	Pass	
Toluene	S15-Ja14924	NCP	%	99			70-130	Pass	
Ethylbenzene	S15-Ja14924	NCP	%	99			70-130	Pass	
m&p-Xylenes	S15-Ja14924	NCP	%	100			70-130	Pass	
o-Xylene	S15-Ja14924	NCP	%	99			70-130	Pass	
Xylenes - Total	S15-Ja14924	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-Ja14924	NCP	%	101			70-130	Pass	
TRH C6-C10	S15-Ja14924	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-Fe00729	NCP	%	101			70-130	Pass	
Cadmium	S15-Fe00729	NCP	%	102			70-130	Pass	
Chromium	S15-Fe00729	NCP	%	90			70-130	Pass	
Copper	S15-Fe00729	NCP	%	93			70-130	Pass	
Lead	S15-Fe00729	NCP	%	88			70-130	Pass	
Mercury	S15-Fe00729	NCP	%	92			70-130	Pass	
Nickel	S15-Fe00729	NCP	%	91			70-130	Pass	
Zinc	S15-Fe00729	NCP	%	105			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-Ja14923	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-Ja14923	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S15-Ja14923	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S15-Ja14923	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S15-Ja14923	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S15-Ja14923	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S15-Ja14923	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-Ja14923	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C6-C10	S15-Ja14923	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	S15-Ja14923	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-Fe01216	NCP	mg/L	0.018	0.019	2.0	30%	Pass	
Cadmium	S15-Fe01216	NCP	mg/L	0.00060	0.00060	5.0	30%	Pass	
Chromium	S15-Fe01216	NCP	mg/L	0.099	0.10	4.0	30%	Pass	
Copper	S15-Fe01216	NCP	mg/L	0.054	0.055	2.0	30%	Pass	
Lead	S15-Fe01216	NCP	mg/L	0.21	0.22	3.0	30%	Pass	
Mercury	S15-Fe01216	NCP	mg/L	0.0032	0.0033	5.0	30%	Pass	
Nickel	S15-Fe01216	NCP	mg/L	0.069	0.071	2.0	30%	Pass	
Zinc	S15-Fe01216	NCP	mg/L	0.21	0.21	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.

Authorised By

Andrew Black	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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coffey

Chain of Custody

446121

No: 07264

Laboratory Quotation / Order No:

Job No: GT25176AA

Sheet 1 of 1

Dispatch to: (Address & Phone No.) Eurofins	Sampled by: Sanit	Consigning Officer: Date Dispatched: 2/2/14
Attention:	Project Manager: (report results to) Mathew Locke	Courier Service: Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Phil H	2/2/15	1245	Parrett	2/2/15	12'45

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:	B4	28									Sample Condition on Receipt
	Soil	1.5, 1.2:p	TP1 - 0.2	29/1/15					✓	✓									
			TP1 - 0.6																
			TP2 - 0.2						✓	✓									
			TP2 - 0.4																
			TP3 - 0.35						✓	✓									
			TP3 - 0.6																
			TP4 - 0.2						✓	✓									
			TP4 - 0.4																
			TP5 - 0.2						✓	✓									
			TP5 - 0.4																
			TP6 - 0.2						✓	✓									
			TP6 - 0.4																

Special Laboratory Instructions:

Detection Limits:

Turnaround Required: Std

02 FEB 2015 17:08

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	GT25176AA
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Feb 2, 2015 5:08 PM
Eurofins | mgt reference:	**446121**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 11.5 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Andrew Black on Phone : (02) 4965 4492 or by e.mail: AndrewBlack@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

eurofins | mgt

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Locke**

Report **446121-S**
Project name GT25176AA
Received Date Feb 02, 2015

Client Sample ID			**TP1_0.2**	**TP2_0.2**	**TP3_0.35**	**TP4_0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Fe01119**	**S15-Fe01121**	**S15-Fe01123**	**S15-Fe01125**
Date Sampled			**Jan 29, 2015**	**Jan 29, 2015**	**Jan 29, 2015**	**Jan 29, 2015**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	21
TRH C15-C28	50	mg/kg	< 50	590	260	1700
TRH C29-C36	50	mg/kg	< 50	260	160	980
TRH C10-36 (Total)	50	mg/kg	< 50	850	420	2700
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	71	85	90	83
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.6
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	55
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	53
TRH >C16-C34	100	mg/kg	< 100	810	410	2600
TRH >C34-C40	100	mg/kg	< 100	280	150	780
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	18	8.2	58
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	19	8.4	58
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	19	8.7	58
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.7
Acenaphthylene	0.5	mg/kg	< 0.5	3.4	0.8	8.9
Anthracene	0.5	mg/kg	< 0.5	8.4	2.3	15
Benz(a)anthracene	0.5	mg/kg	< 0.5	17	7.3	49
Benzo(a)pyrene	0.5	mg/kg	< 0.5	14	6.3	44
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	8.4	3.0	25
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	5.7	2.6	22
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	11	5.0	30
Chrysene	0.5	mg/kg	< 0.5	12	5.2	32
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.2
Fluoranthene	0.5	mg/kg	0.9	36	13	68

Client Sample ID			TP1_0.2	TP2_0.2	TP3_0.35	TP4_0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Fe01119**	**S15-Fe01121**	**S15-Fe01123**	**S15-Fe01125**
Date Sampled			**Jan 29, 2015**	**Jan 29, 2015**	**Jan 29, 2015**	**Jan 29, 2015**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	< 0.5	4.3	< 0.5	5.8
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	4.7	2.2	18
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	4.1
Phenanthrene	0.5	mg/kg	0.6	29	6.2	42
Pyrene	0.5	mg/kg	0.8	33	13	68
Total PAH	0.5	mg/kg	2.3	190	67	430
2-Fluorobiphenyl (surr.)	1	%	102	99	100	105
p-Terphenyl-d14 (surr.)	1	%	121	111	116	116
Heavy Metals						
Arsenic	2	mg/kg	5.1	2.4	2.9	3.6
Cadmium	0.4	mg/kg	3.1	< 0.4	0.5	0.7
Chromium	5	mg/kg	15	6.8	< 5	11
Copper	5	mg/kg	14	9.6	19	40
Lead	5	mg/kg	250	120	620	1200
Mercury	0.05	mg/kg	0.12	0.27	0.92	0.21
Nickel	5	mg/kg	< 5	< 5	5.5	6.4
Zinc	5	mg/kg	630	72	800	390
% Moisture	0.1	%	16	15	13	15

Client Sample ID			TP5_0.2	TP6_0.2
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Fe01127**	**S15-Fe01129**
Date Sampled			**Jan 29, 2015**	**Jan 29, 2015**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	24	36
TRH C15-C28	50	mg/kg	1700	1900
TRH C29-C36	50	mg/kg	1000	950
TRH C10-36 (Total)	50	mg/kg	2700	2900
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	0.2	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	81	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	2.6	0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	74	89
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	72	89
TRH >C16-C34	100	mg/kg	2600	2900
TRH >C34-C40	100	mg/kg	860	720

Client Sample ID			TP5_0.2	TP6_0.2
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Fe01127**	**S15-Fe01129**
Date Sampled			**Jan 29, 2015**	**Jan 29, 2015**
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	50	51
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	50	51
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	50	51
Acenaphthene	0.5	mg/kg	0.8	0.9
Acenaphthylene	0.5	mg/kg	9.2	11
Anthracene	0.5	mg/kg	16	24
Benz(a)anthracene	0.5	mg/kg	40	50
Benzo(a)pyrene	0.5	mg/kg	37	37
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	27	23
Benzo(g.h.i)perylene	0.5	mg/kg	17	17
Benzo(k)fluoranthene	0.5	mg/kg	28	27
Chrysene	0.5	mg/kg	29	29
Dibenz(a.h)anthracene	0.5	mg/kg	1.8	1.5
Fluoranthene	0.5	mg/kg	65	72
Fluorene	0.5	mg/kg	5.6	7.7
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	14	14
Naphthalene	0.5	mg/kg	4.4	2.2
Phenanthrene	0.5	mg/kg	48	68
Pyrene	0.5	mg/kg	64	68
Total PAH	0.5	mg/kg	410	450
2-Fluorobiphenyl (surr.)	1	%	102	101
p-Terphenyl-d14 (surr.)	1	%	115	117
Heavy Metals				
Arsenic	2	mg/kg	5.0	16
Cadmium	0.4	mg/kg	1.0	< 0.4
Chromium	5	mg/kg	9.0	12
Copper	5	mg/kg	40	66
Lead	5	mg/kg	3400	1600
Mercury	0.05	mg/kg	0.67	0.76
Nickel	5	mg/kg	< 5	23
Zinc	5	mg/kg	1000	400
% Moisture	0.1	%	13	8.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite 4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Feb 03, 2015	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Feb 03, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 03, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 03, 2015	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Metals M8	Sydney	Feb 04, 2015	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Feb 03, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
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Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Feb 2, 2015 5:08 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	446121	**Due:**	Feb 9, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GT25176AA				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					HOLD	Metals M8	Eurofins | mgt Suite 4	Moisture Set
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
TP1_0.2	Jan 29, 2015		Soil	S15-Fe01119		X	X	X
TP1_0.6	Jan 29, 2015		Soil	S15-Fe01120	X			
TP2_0.2	Jan 29, 2015		Soil	S15-Fe01121		X	X	X
TP2_0.4	Jan 29, 2015		Soil	S15-Fe01122	X			
TP3_0.35	Jan 29, 2015		Soil	S15-Fe01123		X	X	X
TP3_0.6	Jan 29, 2015		Soil	S15-Fe01124	X			
TP4_0.2	Jan 29, 2015		Soil	S15-Fe01125		X	X	X
TP4_0.4	Jan 29, 2015		Soil	S15-Fe01126	X			
TP5_0.2	Jan 29, 2015		Soil	S15-Fe01127		X	X	X
TP5_0.4	Jan 29, 2015		Soil	S15-Fe01128	X			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
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Project Name:	GT25176AA				

Eurofins | mgt Client Manager: Andrew Black

Sample Detail					HOLD	Metals M8	Eurofins | mgt Suite 4	Moisture Set
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
TP6_0.2	Jan 29, 2015		Soil	S15-Fe01129		X	X	X
TP6_0.4	Jan 29, 2015		Soil	S15-Fe01130	X			

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C9	%	89			70-130	Pass	
TRH C10-C14	%	88			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	98			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
o-Xylene	%	91			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	105			70-130	Pass	
TRH C6-C10	%	82			70-130	Pass	
TRH >C10-C16	%	103			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	113			70-130	Pass	
Acenaphthylene	%	104			70-130	Pass	
Anthracene	%	116			70-130	Pass	
Benz(a)anthracene	%	120			70-130	Pass	
Benzo(a)pyrene	%	112			70-130	Pass	
Benzo(b&j)fluoranthene	%	116			70-130	Pass	
Benzo(g.h.i)perylene	%	80			70-130	Pass	
Benzo(k)fluoranthene	%	116			70-130	Pass	
Chrysene	%	116			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	116			70-130	Pass	
Fluorene	%	107			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	111			70-130	Pass	
Phenanthrene	%	107			70-130	Pass	
Pyrene	%	119			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	98			70-130	Pass	
Cadmium	%	96			70-130	Pass	
Chromium	%	96			70-130	Pass	
Copper	%	94			70-130	Pass	
Lead	%	93			70-130	Pass	
Mercury	%	89			70-130	Pass	
Nickel	%	95			70-130	Pass	
Zinc	%	89			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S15-Fe01524	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S15-Fe01524	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S15-Fe01524	NCP	%	112			70-130	Pass	
Acenaphthylene	S15-Fe01524	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	S15-Fe01524	NCP	%	115			70-130	Pass	
Benz(a)anthracene	S15-Fe01524	NCP	%	116			70-130	Pass	
Benzo(a)pyrene	S15-Fe01524	NCP	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	S15-Fe01524	NCP	%	106			70-130	Pass	
Benzo(g.h.i)perylene	S15-Fe01524	NCP	%	89			70-130	Pass	
Benzo(k)fluoranthene	S15-Fe01524	NCP	%	120			70-130	Pass	
Chrysene	S15-Fe01524	NCP	%	116			70-130	Pass	
Dibenz(a.h)anthracene	S15-Fe01524	NCP	%	87			70-130	Pass	
Fluoranthene	S15-Fe01524	NCP	%	120			70-130	Pass	
Fluorene	S15-Fe01524	NCP	%	107			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S15-Fe01524	NCP	%	88			70-130	Pass	
Naphthalene	S15-Fe01524	NCP	%	113			70-130	Pass	
Phenanthrene	S15-Fe01524	NCP	%	106			70-130	Pass	
Pyrene	S15-Fe01524	NCP	%	125			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S15-Fe00717	NCP	%	105			70-130	Pass	
Cadmium	S15-Fe00717	NCP	%	103			70-130	Pass	
Chromium	S15-Fe00717	NCP	%	104			70-130	Pass	
Copper	S15-Fe00717	NCP	%	102			70-130	Pass	
Lead	S15-Fe00717	NCP	%	104			70-130	Pass	
Mercury	S15-Fe00717	NCP	%	102			70-130	Pass	
Nickel	S15-Fe00717	NCP	%	103			70-130	Pass	
Zinc	S15-Fe00717	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S15-Fe01129	CP	%	87			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Fe01129	CP	%	95			70-130	Pass	
Toluene	S15-Fe01129	CP	%	92			70-130	Pass	
Ethylbenzene	S15-Fe01129	CP	%	88			70-130	Pass	
m&p-Xylenes	S15-Fe01129	CP	%	88			70-130	Pass	
o-Xylene	S15-Fe01129	CP	%	88			70-130	Pass	
Xylenes - Total	S15-Fe01129	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S15-Fe01129	CP	%	94			70-130	Pass	
TRH C6-C10	S15-Fe01129	CP	%	82			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S15-Fe01119	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S15-Fe01119	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S15-Fe01119	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S15-Fe01119	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S15-Fe01119	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S15-Fe01119	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S15-Fe01867	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S15-Fe00715	NCP	mg/kg	4.0	3.3	19	30%	Pass	
Cadmium	S15-Fe00715	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S15-Fe00715	NCP	mg/kg	31	25	22	30%	Pass	
Copper	S15-Fe00715	NCP	mg/kg	20	22	9.0	30%	Pass	
Lead	S15-Fe00715	NCP	mg/kg	7.4	7.7	4.0	30%	Pass	
Mercury	S15-Fe00715	NCP	mg/kg	0.060	0.070	17	30%	Pass	
Nickel	S15-Fe00715	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S15-Fe00715	NCP	mg/kg	28	23	17	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S14-De14683	NCP	%	16	15	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S15-Fe01127	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-Fe01127	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S15-Fe01127	CP	mg/kg	0.2	0.1	23	30%	Pass	
Ethylbenzene	S15-Fe01127	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S15-Fe01127	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S15-Fe01127	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S15-Fe01127	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S15-Fe01127	CP	mg/kg	2.6	1.5	54	30%	Fail	Q15
TRH C6-C10	S15-Fe01127	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C6-C10 less BTEX (F1)	S15-Fe01127	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's Acceptance Criteria as stipulated in SOP 05. Refer to Glossary Page of this report for further details

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

coffey

Chain of Custody

NO: 07337

Laboratory Quotation / Order No: GEOTLCOV25176AA

Job No:

Sheet 1 of 1

#446746

Dispatch to: (Address & Phone No.) Eurofins MGT	Sampled by: Priya Dass	Consigning Officer: Priya Dass Date Dispatched: 6/2/15
Attention:	Project Manager: (report results to) Matthew Locke	Courier Service: Hand delivered Consignment Note No:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Priya Dass	6/2/15	2.00pm	Saf	6/2/5	2:00

Comments	Sample Matrix	Container Type and Preservative	Sample No.	Date Sampled	PAHs	TPHs	MAHs = BTEX	Metals:											Sample Condition on Receipt
	Water	2xV + 1 red plastic	BH1	6/2/15			✓	✓											
		↓	RB	↓			✓	✓											
		2xV	TB				✓												
		↓	TS				✓												

Analyses Required

Special Laboratory Instructions:

Detection Limits:

Turnaround Required: Standard

JOB NUMBER MUST BE REFERENCED ON ALL SUBSEQUENT PAGES

Copies: WHITE: Sign on release. YELLOW: If dispatched to interstate Lab, Lab to sign on receipt and fax back to Coffey. BLUE: To be returned with results.

94220/9-06

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	Matthew Locke
Project name:	GEOTLCOV25176AA
COC number:	07337
Turn around time:	5 Day
Date/Time received:	Feb 6, 2015 2:00 PM
Eurofins | mgt reference:	**446746**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 11 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to Matthew Locke - Matthew_Locke@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Locke**

Report **446746-W**
Project name GEOTLCOV25176AA
Received Date Feb 06, 2015

Client Sample ID			**BH1**	**RB**	**TB**	**TS**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S15-Fe05314**	**S15-Fe05315**	**S15-Fe05316**	**S15-Fe05317**
Date Sampled			**Feb 06, 2015**	**Feb 06, 2015**	**Feb 06, 2015**	**Feb 06, 2015**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	103%
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	100%
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	97%
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	96%
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	97%
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	97%
4-Bromofluorobenzene (surr.)	1	%	121	123	91	102
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	-	-
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Copper (filtered)	0.001	mg/L	0.001	< 0.001	-	-
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	-	-
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Nickel (filtered)	0.001	mg/L	0.001	< 0.001	-	-
Zinc (filtered)	0.001	mg/L	0.021	< 0.001	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Sydney	Feb 09, 2015	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8 filtered	Melbourne	Feb 09, 2015	28 Day
- Method: USEPA 6010/6020 Heavy Metals & USEPA 7470/71 Mercury			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Feb 6, 2015 2:00 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	446746	**Due:**	Feb 13, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Locke
Project Name:	GEOTLCOV25176AA				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Metals M8 filtered	BTEX	BTEX
Laboratory where analysis is conducted							
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X	
Sydney Laboratory - NATA Site # 18217							X
Brisbane Laboratory - NATA Site # 20794							
External Laboratory							
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
BH1	Feb 06, 2015		Water	S15-Fe05314	X	X	
RB	Feb 06, 2015		Water	S15-Fe05315	X	X	
TB	Feb 06, 2015		Water	S15-Fe05316			X
TS	Feb 06, 2015		Water	S15-Fe05317			X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
BTEX									
Benzene			mg/L	< 0.001			0.001	Pass	
Toluene			mg/L	< 0.001			0.001	Pass	
Ethylbenzene			mg/L	< 0.001			0.001	Pass	
m&p-Xylenes			mg/L	< 0.002			0.002	Pass	
o-Xylene			mg/L	< 0.001			0.001	Pass	
Xylenes - Total			mg/L	< 0.003			0.003	Pass	
Method Blank									
Heavy Metals									
Arsenic (filtered)			mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)			mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)			mg/L	< 0.001			0.001	Pass	
Copper (filtered)			mg/L	< 0.001			0.001	Pass	
Lead (filtered)			mg/L	< 0.001			0.001	Pass	
Mercury (filtered)			mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)			mg/L	< 0.001			0.001	Pass	
Zinc (filtered)			mg/L	< 0.001			0.001	Pass	
LCS - % Recovery									
BTEX									
Benzene			%	100			70-130	Pass	
Toluene			%	96			70-130	Pass	
Ethylbenzene			%	92			70-130	Pass	
m&p-Xylenes			%	92			70-130	Pass	
Xylenes - Total			%	92			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic (filtered)			%	99			80-120	Pass	
Cadmium (filtered)			%	100			80-120	Pass	
Chromium (filtered)			%	100			80-120	Pass	
Copper (filtered)			%	98			80-120	Pass	
Lead (filtered)			%	100			80-120	Pass	
Mercury (filtered)			%	82			70-130	Pass	
Nickel (filtered)			%	99			80-120	Pass	
Zinc (filtered)			%	100			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M15-Fe05167	NCP	%	95			70-130	Pass	
Cadmium (filtered)	M15-Fe05167	NCP	%	92			70-130	Pass	
Chromium (filtered)	M15-Fe05167	NCP	%	92			70-130	Pass	
Copper (filtered)	M15-Fe05167	NCP	%	90			70-130	Pass	
Lead (filtered)	M15-Fe05167	NCP	%	90			70-130	Pass	
Mercury (filtered)	M15-Fe05188	NCP	%	93			70-130	Pass	
Nickel (filtered)	M15-Fe05167	NCP	%	91			70-130	Pass	
Zinc (filtered)	M15-Fe05167	NCP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S15-Fe01245	NCP	%	103			70-130	Pass	
Toluene	S15-Fe01245	NCP	%	106			70-130	Pass	
Ethylbenzene	S15-Fe01245	NCP	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	S15-Fe01245	NCP	%	109			70-130	Pass	
o-Xylene	S15-Fe01245	NCP	%	108			70-130	Pass	
Xylenes - Total	S15-Fe01245	NCP	%	109			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M15-Fe05167	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	M15-Fe05167	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M15-Fe05167	NCP	mg/L	0.0021	0.0021	1.0	30%	Pass	
Copper (filtered)	M15-Fe05167	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	M15-Fe05167	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	M15-Fe05167	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M15-Fe05167	NCP	mg/L	0.0016	0.0017	2.0	30%	Pass	
Zinc (filtered)	M15-Fe05167	NCP	mg/L	0.0057	0.0057	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S15-Fe01244	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S15-Fe01244	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S15-Fe01244	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S15-Fe01244	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S15-Fe01244	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S15-Fe01244	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Charl Du Preez	Analytical Services Manager
Carroll Lee	Senior Analyst-Volatile (VIC)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson
National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Enquiries Syd # 445748

Subject: FW: Additional Analysis Required
Attachments: 201502061434.pdf

-----Original Message-----
From: Matthew Barry [mailto:Matt.Barry@coffey.com]
Sent: Friday, 6 February 2015 3:57 PM
To: EnviroSampleNSW
Cc: Matthew Locke
Subject: Additional Analysis Required

Hi,

Please action the following additional analysis;

In regards to Report 445748
BH03_0.2 - LEAD, PAH, TCLP

In regards to Report 445754
HA3 - LEAD, PAH, TCLP, CEC, pH
HA4 - LEAD, PAH, TCLP
HA5 - LEAD, PAH, TCLP, CEC, pH
HA6 - LEAD, PAH, TCLP

Please see attached COC for clarification,

Regards
Matthew Barry

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**Coffey Geotechnics Pty Ltd Chatswood**
Contact name:	-ALL INVOICES ENAURHODXXXXXX
Project name:	ADDITIONAL : GEOTLCOV25176AB
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Feb 6, 2015 3:57 PM
Eurofins | mgt reference:	**446881**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 14.5 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Additional from report 445748/445754

Contact notes

If you have any questions with respect to these samples please contact:

Charl Du Preez on Phone : or by e.mail: charldupreez@eurofins.com.au

Results will be delivered electronically via e.mail to -ALL INVOICES ENAURHODXXXXXX - Rajiv.Chauhan@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Geotechnics Pty Ltd Chatswood email address.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Barry**

Report **446881-L**
Project name ADDITIONAL : GEOTLCOV25176AB
Received Date Feb 06, 2015

Client Sample ID			**BH03_0.2**	**HA3**	**HA4**	**HA5**
Sample Matrix			**TCLP**	**TCLP**	**TCLP**	**TCLP**
Eurofins | mgt Sample No.			**S15-Fe06266**	**S15-Fe06269**	**S15-Fe06270**	**S15-Fe06271**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	0.005	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	0.008	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	0.009	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	0.006	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	0.004	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	0.005	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Fluoranthene	0.001	mg/L	0.001	< 0.001	0.006	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	0.005	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	0.001	< 0.001	0.001	< 0.001
Pyrene	0.001	mg/L	0.001	< 0.001	0.007	< 0.001
Total PAH	0.002	mg/L	0.003	< 0.001	0.057	< 0.001
2-Fluorobiphenyl (surr.)	1	%	126	81	124	108
p-Terphenyl-d14 (surr.)	1	%	125	104	118	113
Heavy Metals						
Lead	0.01	mg/L	1.1	5.1	0.47	1.6
USA Leaching Procedure						
Leachate Fluid[C01]		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.4	7.2	7.7	6.8
pH (off)	0.1	pH Units	5.0	6.7	5.2	4.6
pH (USA HCl addition)	0.1	pH Units	2.0	2.0	2.0	2.0

Client Sample ID			HA6
Sample Matrix			TCLP
Eurofins | mgt Sample No.			S15-Fe06272
Date Sampled			Jan 28, 2015
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH	0.002	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	120
p-Terphenyl-d14 (surr.)	1	%	122
Heavy Metals			
Lead	0.01	mg/L	0.31
USA Leaching Procedure			
Leachate Fluid[C01]		comment	1.0
pH (initial)	0.1	pH Units	9.0
pH (off)	0.1	pH Units	4.8
pH (USA HCl addition)	0.1	pH Units	2.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 11, 2015	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Heavy Metals	Sydney	Feb 10, 2015	180 Day
- Method: E022 Acid Extractable metals in Soils			
USA Leaching Procedure	Sydney	Feb 10, 2015	14 Day
- Method: E019 TCLP Preparation			

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Feb 6, 2015 3:57 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	446881	**Due:**	Feb 13, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Barry
Project Name:	ADDITIONAL : GEOTLCOV25176AB				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Lead	pH (1:5 Aqueous extract)	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Moisture Set	Cation Exchange Capacity
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271									X	X
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH03_0.2	Jan 28, 2015		TCLP	S15-Fe06266	X		X	X		
HA3	Jan 28, 2015		Soil	S15-Fe06267		X			X	X
HA5	Jan 28, 2015		Soil	S15-Fe06268		X			X	X
HA3	Jan 28, 2015		TCLP	S15-Fe06269	X		X	X		
HA4	Jan 28, 2015		TCLP	S15-Fe06270	X		X	X		
HA5	Jan 28, 2015		TCLP	S15-Fe06271	X		X	X		
HA6	Jan 28, 2015		TCLP	S15-Fe06272	X		X	X		

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene			mg/L	< 0.001			0.001	Pass	
Acenaphthylene			mg/L	< 0.001			0.001	Pass	
Anthracene			mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene			mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene			mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene			mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene			mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene			mg/L	< 0.001			0.001	Pass	
Chrysene			mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene			mg/L	< 0.001			0.001	Pass	
Fluoranthene			mg/L	< 0.001			0.001	Pass	
Fluorene			mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene			mg/L	< 0.001			0.001	Pass	
Naphthalene			mg/L	< 0.001			0.001	Pass	
Phenanthrene			mg/L	< 0.001			0.001	Pass	
Pyrene			mg/L	< 0.001			0.001	Pass	
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S15-Fe06272	CP	%	103			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S15-Fe06271	CP	mg/L	1.6	1.5	9.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Charl Du Preez	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)

Glenn Jackson
National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Coffey Geotechnics Pty Ltd Chatswood
Level 18, Tower B, Citadel Tower 799 Pacific Highway
Chatswood
NSW 2067

Attention: **Matthew Barry**

Report **446881-S**
Project name ADDITIONAL : GEOTLCOV25176AB
Received Date Feb 06, 2015

Client Sample ID			**HA3**	**HA5**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S15-Fe06267**	**S15-Fe06268**
Date Sampled			**Jan 28, 2015**	**Jan 28, 2015**
Test/Reference	LOR	Unit		
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	90	19
pH (1:5 Aqueous extract)	0.1	pH Units	7.6	6.8
% Moisture	0.1	%	21	27
Ion Exchange Properties				
Cation Exchange Capacity	0.05	meq/100g	35	15

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Feb 11, 2015	7 Day
- Method: LM-LTM-INO-4010			
Ion Exchange Properties	Melbourne	Feb 11, 2015	
pH (1:5 Aqueous extract)	Sydney	Feb 12, 2015	7 Day
- Method: E018.2 pH			
% Moisture	Sydney	Feb 10, 2015	14 Day
- Method: LTM-GEN-7080 Moisture			

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com.au web : www.eurofins.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	Coffey Geotechnics Pty Ltd Chatswood	**Order No.:**		**Received:**	Feb 6, 2015 3:57 PM
Address:	Level 18, Tower B, Citadel Tower 799 Pacific Highway Chatswood NSW 2067	**Report #:**	446881	**Due:**	Feb 13, 2015
		Phone:	+61 2 9406 1000	**Priority:**	5 Day
		Fax:	+61 2 9406 1002	**Contact Name:**	Matthew Barry
Project Name:	ADDITIONAL : GEOTLCOV25176AB				

Eurofins | mgt Client Manager: Charl Du Preez

Sample Detail					Lead	pH (1:5 Aqueous extract)	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Moisture Set	Cation Exchange Capacity
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271									X	X
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
BH03_0.2	Jan 28, 2015		TCLP	S15-Fe06266	X		X	X		
HA3	Jan 28, 2015		Soil	S15-Fe06267		X			X	X
HA5	Jan 28, 2015		Soil	S15-Fe06268		X			X	X
HA3	Jan 28, 2015		TCLP	S15-Fe06269	X		X	X		
HA4	Jan 28, 2015		TCLP	S15-Fe06270	X		X	X		
HA5	Jan 28, 2015		TCLP	S15-Fe06271	X		X	X		
HA6	Jan 28, 2015		TCLP	S15-Fe06272	X		X	X		

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	S15-Fe06267	CP	uS/cm	90	98	9.0	30%	Pass	
% Moisture	S15-Fe08081	NCP	%	24	24	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Charl Du Preez	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)

Glenn Jackson
National Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1502250**

Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Contact	: Client Services
Address	: 8/12 MARS ROAD LANE COVE WEST NSW, AUSTRALIA 2066	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: matthew.locke@coffey.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 9911 1000	Telephone	: +61-2-8784 8555
Facsimile	: +61 +61 9911 1001	Facsimile	: +61-2-8784 8500
Project	: GT25076AB	Page	: 1 of 2
Order number	: ----		
C-O-C number	: 07262	Quote number	: ES2014COFENV0369 (EN/077/14)
Site	: ----		
Sampler	: MB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 02-FEB-2015	Issue Date	: 02-FEB-2015 14:53
Client Requested Due Date	: 09-FEB-2015	Scheduled Reporting Date	: **09-FEB-2015**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 16.8'C - Ice bricks present
No. of coolers/boxes	: 1	No. of samples received	: 1
Security Seal	: Intact.	No. of samples analysed	: 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - S-19 TRH/BTEXN/P/Ph/OC/OP/PCB/8 metals
ES1502250-001	28-JAN-2015 15:00	QC2A	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

MR MATTHEW LOCKE

- *AU Certificate of Analysis - NATA (COA)	Email	matthew.locke@coffey.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	matthew.locke@coffey.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	matthew.locke@coffey.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	matthew.locke@coffey.com
- A4 - AU Tax Invoice (INV)	Email	matthew.locke@coffey.com
- Attachment - Report (SUBCO)	Email	matthew.locke@coffey.com
- Chain of Custody (CoC) (COC)	Email	matthew.locke@coffey.com
- EDI Format - ENMRG (ENMRG)	Email	matthew.locke@coffey.com
- EDI Format - ESDAT (ESDAT)	Email	matthew.locke@coffey.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1502250**	Page	: 1 of 8
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Contact	: Client Services
Address	: 8/12 MARS ROAD LANE COVE WEST NSW, AUSTRALIA 2066	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: matthew.locke@coffey.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 9911 1000	Telephone	: +61-2-8784 8555
Facsimile	: +61 +61 9911 1001	Facsimile	: +61-2-8784 8500
Project	: GT25076AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: 07262	Date Samples Received	: 02-FEB-2015
Sampler	: MB	Issue Date	: 09-FEB-2015
Site	: ----		
		No. of samples received	: 1
Quote number	: EN/077/14	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC2A	----	----	----	----
			Client sampling date / time	28-JAN-2015 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1502250-001	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	**27.3**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**16**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	**2**	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**25**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**174**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**3360**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**23**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**1250**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.7**	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC2A	----	----	----	----
			Client sampling date / time	28-JAN-2015 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1502250-001	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----
^ Sum of DDD + DDE + DDT	----	0.05	mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC2A	----	----	----	----
			Client sampling date / time	28-JAN-2015 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1502250-001	----	----	----	----
EP075(SIM)A: Phenolic Compounds - Continued								
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	**0.6**	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	**3.3**	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	**1.0**	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	**15.5**	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	**4.3**	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	**36.0**	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	**37.2**	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	**20.6**	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	**18.5**	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	**17.7**	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	**6.9**	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	**21.7**	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	**7.1**	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	**1.8**	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	**8.2**	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	**200**	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	**29.0**	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**29.0**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**29.0**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	**470**	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	**280**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**750**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC2A	----	----	----	----
			Client sampling date / time	28-JAN-2015 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1502250-001	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	**660**	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	**120**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	**780**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	**80.0**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	**90.6**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	**70.1**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**83.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**87.4**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**86.1**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**90.3**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**80.2**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**96.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**96.6**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC2A	----	----	----	----
			Client sampling date / time	28-JAN-2015 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1502250-001	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
Toluene-D8	2037-26-5	0.1	%	**100**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**100**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

QUALITY CONTROL REPORT

Work Order	: **ES1502250**	Page	: 1 of 14
Client	: **COFFEY ENVIRONMENTS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Contact	: Client Services
Address	: 8/12 MARS ROAD LANE COVE WEST NSW, AUSTRALIA 2066	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: matthew.locke@coffey.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 9911 1000	Telephone	: +61-2-8784 8555
Facsimile	: +61 +61 9911 1001	Facsimile	: +61-2-8784 8500
Project	: GT25076AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 07262	Date Samples Received	: 02-FEB-2015
Sampler	: MB	Issue Date	: 09-FEB-2015
Order number	: ----		
		No. of samples received	: 1
Quote number	: EN/077/14	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out ir compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 3808122)									
ES1502249-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	8.2	8.4	1.9	No Limit
ES1502258-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.0	20.4	7.1	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 3813817)									
ES1502029-010	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	24	22	6.8	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	6	5	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	7	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES1502256-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	2	2	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	87	84	2.8	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	60	59	2.0	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	18	17	7.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	145	143	1.0	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	211	207	2.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	722	679	6.2	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3813818)									
ES1502029-010	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1502256-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	1.3	1.3	0.0	0% - 50%
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 3808195)									
ES1502236-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1502236-009	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3808194)									
ES1502236-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3808194) - continued									
ES1502236-001	Anonymous	EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 3808194)									
ES1502236-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 3808197)									
ES1502236-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP075(SIM)A: Phenolic Compounds (QC Lot: 3808197) - continued									
ES1502236-001	Anonymous	EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1502236-009	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3808197)									
ES1502236-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1502236-009	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3808197) - continued									
ES1502236-009	Anonymous	EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3807910)									
ES1502222-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1502249-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3808196)									
ES1502236-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1502236-009	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3807910)									
ES1502222-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1502249-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3808196)									
ES1502236-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1502236-009	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3807910)									
ES1502222-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 3807910) - continued									
ES1502222-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1502249-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3813817)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	117	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	101	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	110	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	102	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.7	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	109	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	103	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3813818)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	80.2	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3808195)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	102	57.4	117
EP068A: Organochlorine Pesticides (OC) (QCLot: 3808194)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	71	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	103	66	122
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	102	69	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	71	115
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	65	113
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.0	68	116
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	68	118
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	94.1	68	116
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	68	120
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.2	69	119
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.1	67	121
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	93.8	66	118
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.5	69	117
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	75.7	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.0	76	120
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.1	76	120
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	104	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.4	60	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	81.8	67	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	65	123

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP068A: Organochlorine Pesticides (OC) (QCLot: 3808194) - continued								
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	71.4	65	129
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3808194)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	74.0	56	126
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.4	64	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	60.8	54	122
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	76.3	64	124
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	81.6	73	117
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	81.2	55	119
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	71.4	69	123
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	74.9	70	120
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.5	71	115
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	89.5	68	114
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	101	68	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	69	115
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	70	118
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	68	116
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	77.0	64	120
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	68	116
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	85.7	70	118
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	67	123
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	64.0	42	126
EP075(SIM)A: Phenolic Compounds (QCLot: 3808197)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	96.7	74	116
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	97.0	74	116
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	98.2	72	116
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	98.9	69	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	76.1	60.3	117
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	112	69	117
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	93.2	68	112
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	95.9	73	117
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	90.5	76.4	114
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	83.8	57	111
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	86.1	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	30.0	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3808197)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	101	80	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3808197) - continued								
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	98.9	77	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	97.6	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	98.5	77	123
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	99.1	79	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	99.2	79	123
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	94.9	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	95.7	79	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	93.8	73	121
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	97.8	81	123
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	4 mg/kg	91.8	70	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	99.5	77	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	97.0	76	122
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	89.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	88.0	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	90.6	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3807910)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	122	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3808196)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	114	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	115	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	98.1	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3807910)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	121	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3808196)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	107	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	112	74	138
EP071: >C34 - C40 Fraction	----	50	mg/kg	<100	150 mg/kg	74.4	63	131
EP080: BTEXN (QCLot: 3807910)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	111	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	113	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	106	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	108	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	112	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	108	62	138

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3813817)							
ES1502029-010	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.5	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	99.0	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	98.0	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.1	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	97.2	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3813818)							
ES1502029-010	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.2	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3808195)							
ES1502236-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	102	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3808194)							
ES1502236-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	76.5	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	82.8	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	88.9	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	86.7	70	130
		EP068: Endrin	72-20-8	2 mg/kg	91.6	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	82.6	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3808194)							
ES1502236-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	94.8	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	93.3	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	93.0	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	94.3	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	77.9	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 3808197)							
ES1502236-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	106	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	108	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	99.7	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	105	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	52.5	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3808197)							

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3808197) - continued							
ES1502236-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3807910)							
ES1502222-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	114	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3808196)							
ES1502236-001	Anonymous	EP071: C10 - C14 Fraction	----	560 mg/kg	93.4	73	137
		EP071: C15 - C28 Fraction	----	2370 mg/kg	93.1	53	131
		EP071: C29 - C36 Fraction	----	1695 mg/kg	89.5	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3807910)							
ES1502222-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	111	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3808196)							
ES1502236-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	902 mg/kg	95.3	73	137
		EP071: >C16 - C34 Fraction	----	3190 mg/kg	94.3	53	131
		EP071: >C34 - C40 Fraction	----	1087 mg/kg	84.4	52	132
EP080: BTEXN (QCLot: 3807910)							
ES1502222-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	90.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	89.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.2	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	86.6	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

The quality control term Matrix Spike (MS) and Matrix Spike Duplicate (MSD) refers to intralaboratory split samples spiked with a representative set of target analytes. The purpose of these QC parameters are to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPDs (%) Value	RPDs (%) Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3807910)										
ES1502222-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	114	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3807910)										
ES1502222-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	111	----	70	130	----	----
EP080: BTEXN (QCLot: 3807910)										
ES1502222-001	Anonymous									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPDs (%): Value	RPDs (%): Control Limit
EP080: BTEXN (QCLot: 3807910) - continued										
ES1502222-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	90.9	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	91.4	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	89.4	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.6	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.2	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	86.6	----	70	130	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 3808194)										
ES1502236-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	76.5	----	70	130	----	----
		EP068: Heptachlor	76-44-8	0.5 mg/kg	82.8	----	70	130	----	----
		EP068: Aldrin	309-00-2	0.5 mg/kg	88.9	----	70	130	----	----
		EP068: Dieldrin	60-57-1	0.5 mg/kg	86.7	----	70	130	----	----
		EP068: Endrin	72-20-8	2 mg/kg	91.6	----	70	130	----	----
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	82.6	----	70	130	----	----
EP068B: Organophosphorus Pesticides (OP) (QCLot: 3808194)										
ES1502236-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	94.8	----	70	130	----	----
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	93.3	----	70	130	----	----
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	93.0	----	70	130	----	----
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	94.3	----	70	130	----	----
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	77.9	----	70	130	----	----
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 3808195)										
ES1502236-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	102	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3808196)										
ES1502236-001	Anonymous	EP071: C10 - C14 Fraction	----	560 mg/kg	93.4	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	2370 mg/kg	93.1	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	1695 mg/kg	89.5	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3808196)										
ES1502236-001	Anonymous	EP071: >C10 - C16 Fraction	>C10_C16	902 mg/kg	95.3	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	3190 mg/kg	94.3	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	1087 mg/kg	84.4	----	52	132	----	----
EP075(SIM)A: Phenolic Compounds (QCLot: 3808197)										
ES1502236-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	106	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	108	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	99.7	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	105	----	70	130	----	----

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP075(SIM)A: Phenolic Compounds (QCLot: 3808197) - continued										
ES1502236-001	Anonymous	EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	52.5	----	20	130	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3808197)										
ES1502236-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.7	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	106	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3813817)										
ES1502029-010	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.5	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	99.0	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	104	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	98.0	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	99.1	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	97.2	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3813818)										
ES1502029-010	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	90.2	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1502250**	Page	: 1 of 5
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR MATTHEW LOCKE	Contact	: Client Services
Address	: 8/12 MARS ROAD LANE COVE WEST NSW, AUSTRALIA 2066	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: matthew.locke@coffey.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 9911 1000	Telephone	: +61-2-8784 8555
Facsimile	: +61 +61 9911 1001	Facsimile	: +61-2-8784 8500
Project	: GT25076AB	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 07262	Date Samples Received	: 02-FEB-2015
Sampler	: MB	Issue Date	: 09-FEB-2015
Order number	: ----		
		No. of samples received	: 1
Quote number	: EN/077/14	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) QC2A	**28-JAN-2015**	**----**	----	----	**03-FEB-2015**	11-FEB-2015	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC2A	**28-JAN-2015**	**06-FEB-2015**	27-JUL-2015	✓	**07-FEB-2015**	27-JUL-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC2A	**28-JAN-2015**	**06-FEB-2015**	25-FEB-2015	✓	**08-FEB-2015**	25-FEB-2015	✓
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**05-FEB-2015**	15-MAR-2015	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**05-FEB-2015**	15-MAR-2015	✓
EP068B: Organophosphorus Pesticides (OP)							
Soil Glass Jar - Unpreserved (EP068) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**05-FEB-2015**	15-MAR-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**04-FEB-2015**	15-MAR-2015	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**04-FEB-2015**	15-MAR-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**04-FEB-2015**	15-MAR-2015	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**03-FEB-2015**	11-FEB-2015	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) QC2A	**28-JAN-2015**	**03-FEB-2015**	11-FEB-2015	✓	**03-FEB-2015**	11-FEB-2015	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	10	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	2	11	18.2	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	13	15.4	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	10	10.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Polychlorinated Biphenyls (PCB)	EP066	1	11	9.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	13	7.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In-house. A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 21st ed., 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

Appendix E - Equipment Calibration Records

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Equipment Report - MINIRAE 2000 PID

This PID has been performance checked / calibrated* as follows:

Calibration	Actual Value	Reading	Pass?		
Zero – fresh air	0.0 ppm	0.0 ppm	☑		
Span – Isobutylene	100 ppm	101 ppm	☑		
Set Alarm limits to	High	100 ppm	Low	50 ppm	
Operations Check					

☑ Performance Check (pump, lamp, sensor & battery voltage check)

☑ Battery Charged ☑ Filters Check ☑ Spare battery Voltage (5.5v minimum) 6 V

☑ Electrical Safety Tag attached (AS/NZS 3760) Tag No: TFR054 Valid to: 30/09/2014

☑ Bump test / Date: 23/01/2015

* *Calibration gas traceability information is available upon request.*

This PID has been performance checked / calibrated* as follows:

Date: 23/01/2015 Checked by: MILENKO

Signed: [signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☑	☐	MiniRae 2000 PID / Operational Check, plus Battery Voltage @ 5.4 V
☑	☐	Lamp Voltage @ 10.6 eV Compound Set to: ISOBUTYLENE C/factor: 1
☑	☐	Protective yellow rubber boot
☑	☐	Inlet probe (attached to PID)
☑	☐	Spare water trap filter(s) Qty 1
☑	☐	Charger 240V to 12V 500mA
☑	☐	Instruction Manual behind foam on the lid of case *
☑	☐	Quick Guide Sheet behind foam on the lid of case *
☑	☐	Spare Alkaline Battery Compartment with batteries
☒	☐	Inline Moisture trap Filter Guide Laminated
☒	☐	Calibration regulator & tubing (optional)
☑	☐	Carry Case
	☐	Check to confirm electrical safety (tag must be valid)
☐	☐	

Processors Signature/ Initials MS

Quote Reference	CS001992	Condition on return
Customer Ref		
Equipment ID	PID MINSAJ	
Equipment serial no.	110901928	
Return Date	/ /	
Return Time		

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Phone: (Free Call) 1300 735 295 | Fax: (Free Call) 1800 675 123 | Email: RentalsAU@Thermofisher.com

Melbourne Branch, 5 Caribbean Drive, Scoresby 3179 | Sydney Branch, Level 1, 4 Talavera Road, North Ryde 2113 | Adelaide Branch, 27 Beulah Road, Norwood, South Australia 5067 | Brisbane Branch, Unit 2/5 Ross St, Newstead 4006 | Perth Branch, 121 Beringarra Ave, Malaga WA 6090

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RENTALS

Equipment Report - MINIRAE 2000 PID

This PID has been performance checked / calibrated* as follows:

Calibration	Actual Value	Reading	Pass?		
Zero – fresh air	0.0 ppm	0.0 ppm	☑		
Span – Isobutylene	100 ppm	101 ppm	☑		
Set Alarm limits to	High	100 ppm	Low	50 ppm	
Operations Check					

☑ Performance Check (pump, lamp, sensor & battery voltage check)

☑ Battery Charged ☑ Filters Check ☑ Spare battery Voltage (5.5v minimum) 6 V

☑ Electrical Safety Tag attached (AS/NZS 3760) Tag No: 008056 Valid to:.....

☑ Bump test / Date: 23/01/2015

* *Calibration gas traceability information is available upon request.*

This PID has been performance checked / calibrated* as follows:

Date: 23/01/2015 Checked by: MILENKO

Signed: _____

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☑	☐	MiniRae 2000 PID / Operational Check, plus Battery Voltage 5.4 V
☑	☐	Lamp Voltage @ 10.6 eV Compound Set to: ISOBUTYLENE C/factor: 1
☑	☐	Protective yellow rubber boot
☑	☐	Inlet probe (attached to PID)
☑	☐	Spare water trap filter(s) Qty 1
☑	☐	Charger 240V to 12V 500mA
☑	☐	Instruction Manual behind foam on the lid of case *
☑	☐	Quick Guide Sheet behind foam on the lid of case *
☑	☐	Spare Alkaline Battery Compartment with batteries
☑	☐	Inline Moisture trap Filter Guide Laminated
☑	☐	Calibration regulator & tubing (optional)
☑	☐	Carry Case
	☐	Check to confirm electrical safety (tag must be valid)
☐	☐	

Processors Signature/ Initials MS

Quote Reference	CS001991	Condition on return
Customer Ref		
Equipment ID	PID MINSX	
Equipment serial no.	110009778	
Return Date	/ /	
Return Time		

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RENTALS

Equipment Certification Report – TPS 90FLMV Water Quality Meter

This Water Quality Meter has been performance checked and calibrated as follows:

Sensor	Concentration	Span 1	Span 2	Traceability Lot #	Pass?
pH	pH 7.00 / pH 4.00	7,00 pH	4,00 pH	/	☑
Conductivity	2.76mS/cm	0,00 mS/cm	2,76 mS/cm		☑
TDS	36 ppk	0,0 ppk	36,0 ppk		☑
Dissolved Oxygen	Sodium Sulphite / Air	0,00 ppm in Sodium Sulphite	8,79 ppm Saturation in Air		☑
Check only					
Redox (ORP) *	Electrode operability test	240mV +/- 10%	232 mV		☑

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

☑ Battery Status 7,50 (min 7.2V)
☑ Electrical Safety Tag attached (AS/NZS 3760)

Tag No: TFN R070

Valid to: 05/03/2015

☑ Temperature 21,3 °C
☐ Electrodes Cleaned and checked

Date: 05/02/2015

Signed: Sergio R.

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☐	☐	90FLMV Unit. Ops check/Battery status: 8,24
☐	☐	pH sensor with wetting cap, 5m
☐	☐	Conductivity/TDS/Temperature K=10 sensor, 5m
☐	☐	Dissolved oxygen YSI5739 sensor with wetting cap, 5m
☐	☐	Redox (ORP) sensor with wetting cap, 5m
☐	☐	Turbidity sensor, 5m
☐	☐	Power supply 240V to 12V DC 200mA
☐	☐	Instruction Manual
☐	☐	Quick Guide
☐	☐	Syringe with storage solution for pH and ORP sensors
☐	☐	Carry Case
☐	☐	Check to confirm electrical safety (tag must be valid)

Date: 05/02/2015

Signed: Sergio R.

TFS Reference	CS002089	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	90FLMVSM	Condition on return:	
Equipment Serial No.	T3231		

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RENTALS

Equipment Report – Solinst Model 122 Interface Meter

This Meter has been performance checked / calibrated* as follows:

Cleaned/Tested **Pass?** ☑ **Yes** ☐ **No**

☑ Probe

☑ Tape/Reel

☑ Performance Test & Battery Voltage Check (8.5 v) 8.0v minimum

Date: 04/02/2015 Checked by: Dave O'Neill

Signed: [signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
✓	☐	☐	Operations check OK
✓	☐	☐	Plastic Box / Bag
✓	☐	☐	Spare 9V Battery Qty 1
✓	☐	☐	Probe Cleaning Brush
✓	☐	☐	Decon
✓	☐	☐	Instruction leaflet
✓	☐	☐	Tape Guide
☐	☐	☐	

Processors Signature/ Initials SR

Quote Reference	CS002089	Condition on return
Customer Ref		
Equipment ID	SOL122-7	
Equipment serial no.	224694	
Return Date	/ /	
Return Time		

Appendix F – Groundwater Field Data Sheets

coffey

FIELD REPORTING COVER SHEET

Project Name: Uni of Sydney, Darlington Terraces **Date:** 6/2/15

Project Number: GEOTLCOV25176AA **Arrival Time:** 9:00 a.m.

Field Personnel (initials): PD **Departure Time:** _____

Project Manager (initials): ML

Purpose of Visit (Tick Appropriate Box)

Drilling	☐	GW Sampling	☑	Soil Sampling	☐
Gauging	☑	Cable locating	☐	Other	☐
Site inspection	☐	Tank removal and validation	☐	Specify: _____	

Tick Equipment Used

FID	☐	LEL/O2/Toxic Gas meter	☐
PID	☐	Water Quality meter	☑
IP	☑	Other meter(s)	☐

Field Equipment Calibration Details attached : ☑

Other Calibration Performed (if any): _____

Sampling

Sampling Conducted: Y ☑ N ☐ Matrix: Soil ☐ Water ☑ Other ☐

COC Completed and Samples Sent: Y ☑ N ☐ COC No(s): 07337

Primary Lab: EUROFINS MGT Secondary Lab: N/A

Description of Activities (e.g., What did you do – drilled 3 soil borings (i.e. SB1 – SB7), installed 3 MWs, etc.

– ~~Purged~~ Gauged & purged water at ~~bor.~~ groundwater boreholes BH1 & BH4 → only BTEX & Metals. Sample recovery was not good.
– Collected sample from BH1. BH4 had purged dry & no water could be recovered from it, even after waiting for a while.

Attached Forms

Daily Field Summary:	Y ☑	N ☐	Relevant Field Forms (list): _____
Site Map / Sketch:	Y ☑	N ☐	Others (Specify): _____
Field Quality Control Log	Y ☑	N ☑ N/A	

coffey

Well Gauging Form

PROJECT NAME: Uni of Syd, Darlington Terraces
PROJECT NUMBER: GEOTLCOV25176AA
FIELD PERSONNEL: PD
DATE: 6/2/15
PROJECT MANAGER: ML

FIELD EQUIPMENT:
Equipment Used: IP Meter IP Serial Number:

REFER TO SOPs WHEN GAUGING WELLS:
SOP - Monitoring Well Gauging and SOP – Decontamination of Sampling Equipment

Time of Day	Well ID	Well Diameter	Total Well Depth note 1	Depth to PSH (NAPL) [A]	Depth to Groundwater [B]	PSH Thickness [B-A]	Height of Well Stick-Up	COMMENTS (notes 2 & 3) ODOUR, COLOUR, SHEEN, NAPL (and its colour), REMEDIATION SYSTEM, etc
		mm	m	mBTOC	mBTOC	mm	m	
9:45a.m.	BH1	50	4.640	–	3.205	–	flush	No odour. Well in good condition. No sheen etc observed
10:30a.m.	BH4	"	4.410	–	4.170	–	"	" " Sediments at bottom.

coffey

Groundwater Sampling Form (A) - General

PROJECT NAME: Uni of Sydney, Darlington Terraces **PROJECT NUMBER:** GEOTLCOV25176AA

FIELD PERSONNEL: PD **DATE:** 6/2/15

PROJECT MANAGER: ML

WELL ID: BH1 **METER ID& TYPE :** **TOTAL WELL DEPTH:** 4.640 **SCREEN INTERVAL:**

EQUIPMENT USED: BAILER ☑ **WATERRA** ☐ **OTHER** **WELL DIAMETER:** 50MM **WELL STICK-UP:** flush

WELL GAUGING AND PURGE VOLUME CALCULATIONS

(TOTAL WELL DEPTH) – (DEPTH TO WATER) = (WATER COLUMN)

4.640 m - 3.205 = ~1.400 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME

~6 L × 3 = 18 l.

WELL HEADSPACE PID READING

PID READING

PPM:

ORP REFERENCE ELECTRODE: (circle) SHE / Calomel Saturated KCl / Ag/AgCl 1M KCl / Ag/AgCl 4M KCl / Ag/AgCl Saturated KCl

TIME OF DAY	CYCLE/ PUMP RATE (ml/min)	VOLUME (L)	DEPTH TO WATER (m)	DISSOLVED OXYGEN (mg/l)		ELECTRICAL CONDUCTIVITY (mS or µS/cm)		pH (pH units)		REDOX POTENTIAL (mV)		TEMPERATURE (°C)		CLARITY – tick one					COMMENTS
				READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE	Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	ODOUR, COLOUR, SEDIMENTS, PSH COLLECTED, etc
10:09am.		1	~~4.16~~	~~ppm~~ 4.16	ppm	628	uS/cm	4.95	~~pH~~	151	mV	21.1	°C			✓			No odour. Pale yellow brown
10:17am.		5		2.39		589		4.97		141		20.6					✓		// Pale brown.
					Well	purged dry at 6l at				10:18 a.m.									
						+ metals													
11:35am.			4.364		Collected vial samples. Well purged dry.												✓		No odour. Pale brown
					No post purge WQM readings obtained.														
STABILISATION CRITERIA (3 readings within following ranges)				± 10%		± 3%		± 0.1 unit		± 10mV		± 0.2°C							

DUPLICATE COLLECTED: Y ☐ N ☑ DUPLICATE ID: **TRIPLICATE COLLECTED:** Y ☐ N ☑ TRIPLICATE ID:

WERE METALS FIELD FILTERED? Y ☑ N ☐ ~~N/A~~ Unfiltered samples must not be put into a preserved container (i.e. 'metals' bottle) **HAS THIS FORM BEEN COMPLETED IN FULL?** Y ☑ N ☐

coffey

Groundwater Sampling Form (A) - General

PROJECT NAME: Uni of Sydney, Darlington Terraces **PROJECT NUMBER:** GEOTLCOV25176AA

FIELD PERSONNEL: PD **DATE:** 6/2/15

PROJECT MANAGER: ML

WELL ID: BH4 **METER ID& TYPE :** **TOTAL WELL DEPTH:** 4.410 **SCREEN INTERVAL:**

EQUIPMENT USED: BAILER ☑ **WATERRA** ☐ **OTHER** **WELL DIAMETER:** 50mm **WELL STICK-UP:** flush

WELL GAUGING AND PURGE VOLUME CALCULATIONS

(TOTAL WELL DEPTH) – (DEPTH TO WATER) = (WATER COLUMN)

4.410 m - 4.170 = 0.240 m

Use water column calculation together with the procedures in 'SOP- Groundwater Sampling - Bailers' to determine the correct volume to be purged from the well (enter this value in the field to the right)

LITRES PER 1 WELL VOLUME

~1 L x 3 = 3l.

WELL HEADSPACE PID READING

PID READING

PPM:

ORP REFERENCE ELECTRODE: (circle) SHE / Calomel Saturated KCl / Ag/AgCl 1M KCl / Ag/AgCl 4M KCl / Ag/AgCl Saturated KCl

TIME OF DAY	CYCLE/ PUMP RATE (ml/min)	VOLUME (L)	DEPTH TO WATER (m)	DISSOLVED OXYGEN (mg/l)		ELECTRICAL CONDUCTIVITY (mS or µS/cm)		pH (pH units)		REDOX POTENTIAL (mV)		TEMPERATURE (°C)		CLARITY – tick one					COMMENTS
				READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE*	READING	CHANGE	Clear	Slightly Cloudy	Cloudy	Very Cloudy	Turbid	ODOUR, COLOUR, SEDIMENTS, PSH COLLECTED, etc
10:45a.m.		100ml		No W&M measured. Not enough water														✓	No odour. Brown. Northern etc. collected in amber bottle.
				Well purged dry at 10:45a.m.															
11:45a.m.			4.220m		~~collected but incomplete~~													✓	No odour. Brown.
					No ~~other~~ samples ~~of~~ or WQM parameters could be collected. ~~Well purged~~														
					~~dry~~ Water recovered too turbid														
STABILISATION CRITERIA (3 readings within following ranges)				± 10%		± 3%		± 0.1 unit		± 10mV		± 0.2°C							

DUPLICATE COLLECTED: Y ☐ N ☑ ~~Y~~ N/A DUPLICATE ID:

TRIPLICATE COLLECTED: Y ☐ N ☑ ~~Y~~ N/A TRIPLICATE ID:

WERE METALS FIELD FILTERED? Y ☐ N ☐ N/A Unfiltered samples must not be put into a preserved container (i.e. 'metals' bottle)

HAS THIS FORM BEEN COMPLETED IN FULL? Y ☑ N ☐

coffey

FIELD QUALITY CONTROL LOG

Project No.	GEOTLCOV25176AA
Date:	6/2/15
Page	1 of 1

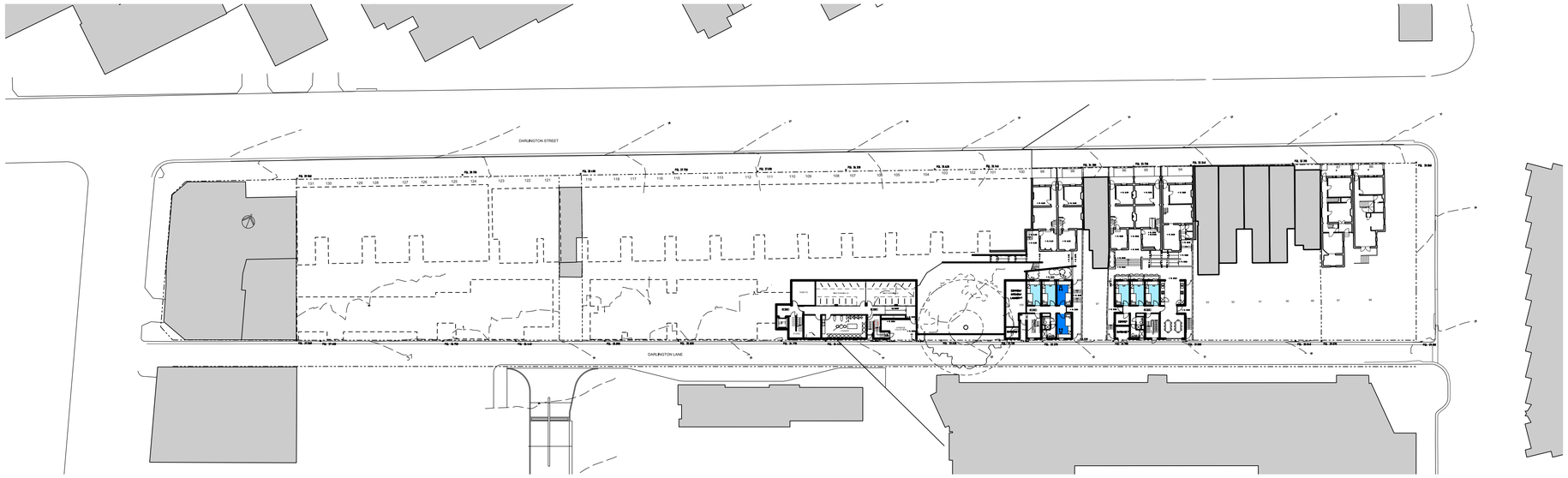
Project Name: University of Sydney, Darlington Terraces

Field Personnel (Initials): PD **Project Manager (Initials):** ML

Field QC Sample ID	Sampling Date/ Time	QC Type	Sample Matrix	Details of laboratory supplied UHP water (if used)	
				Batch No.	Grade
(example) QC7	8/04/2006; 0900	Duplicate of SB1/4.0	soil	batch #	
RB	6/2/15	Rinsate Blank	Water		
TB	↓	Trip Blank	↓		
TS		Trip Spike			

UHP grades: V- VOC, S-SVOC, M, metals and inorganics.

Appendix G – Proposed Construction Design Drawings



4 SITE PLAN 1 - LEVELS RELATING TO LANE
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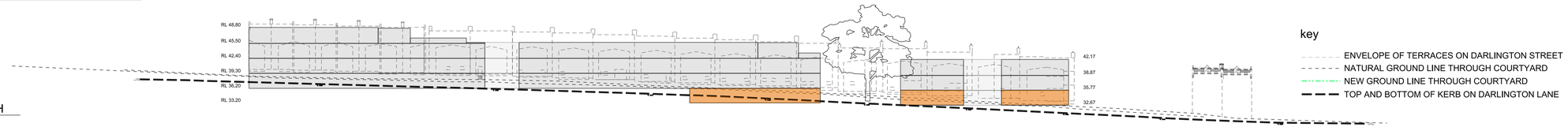

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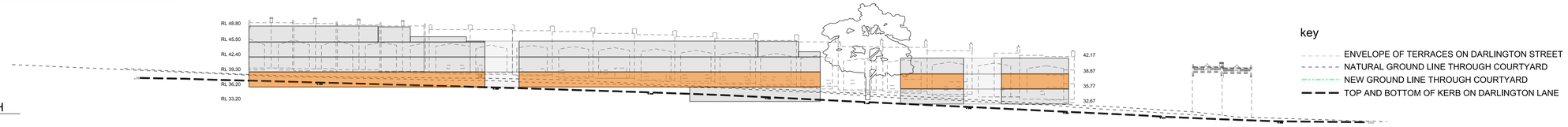
1:500

2 SITE PLAN 2 - LEVELS RELATING TO COURTYARD
1:500



1 ELEVATION SOUTH
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Revisions				
No	Date	Description	Ver	App'd
01	07.11.14	ISSUE FOR COORDINATION		
02	24.02.15	PRELIMINARY ISSUE		

Revisions				
No	Date	Description	Ver	App'd

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Nominated Architects. Michael Heenan 5264, Peter Ireland 6661

Key

Client
CIS - THE UNIVERSITY OF SYDNEY

Consultants

Architect
AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project
DARLINGTON TERRACES

Proj No.

NORTH

Drawing Title
SITE PLANS
LANE + COURTYARD

Drawing Status
NOT FOR CONSTRUCTION

Scale 1:500
Drawing No DA1001
Issue 02

A1

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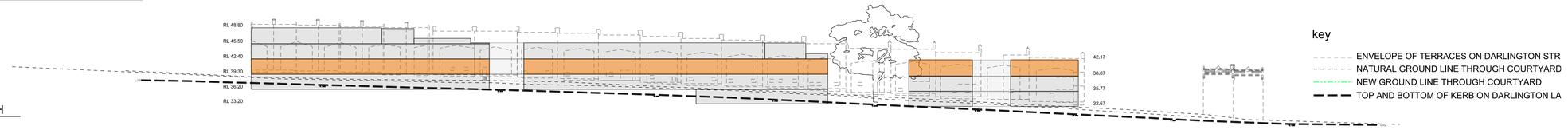
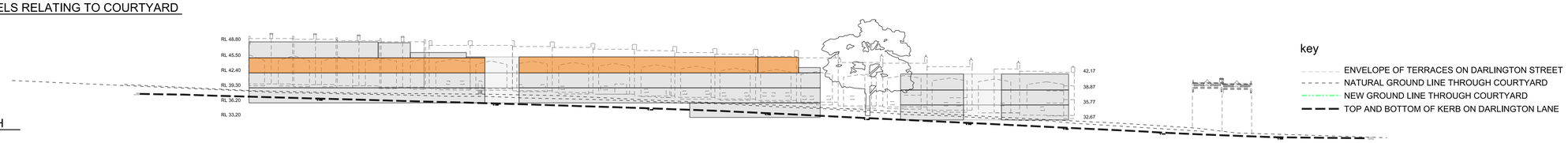


3 ELEVATION SOUTH
1:500

2 SITE PLAN 2 - LEVELS RELATING TO COURTYARD
1:500



1 ELEVATION SOUTH
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Revisions				
No	Date	Description	Ver	App'd
01	07.11.14	ISSUE FOR COORDINATION		
02	24.02.15	PRELIMINARY ISSUE		

Revisions				
No	Date	Description	Ver	App'd

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Architect
AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
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Project
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Proj No.

NORTH

Drawing Title
SITE PLANS

Drawing Status
NOT FOR CONSTRUCTION

Scale
1:500

Drawing No
DA1002

Issue
02

A1

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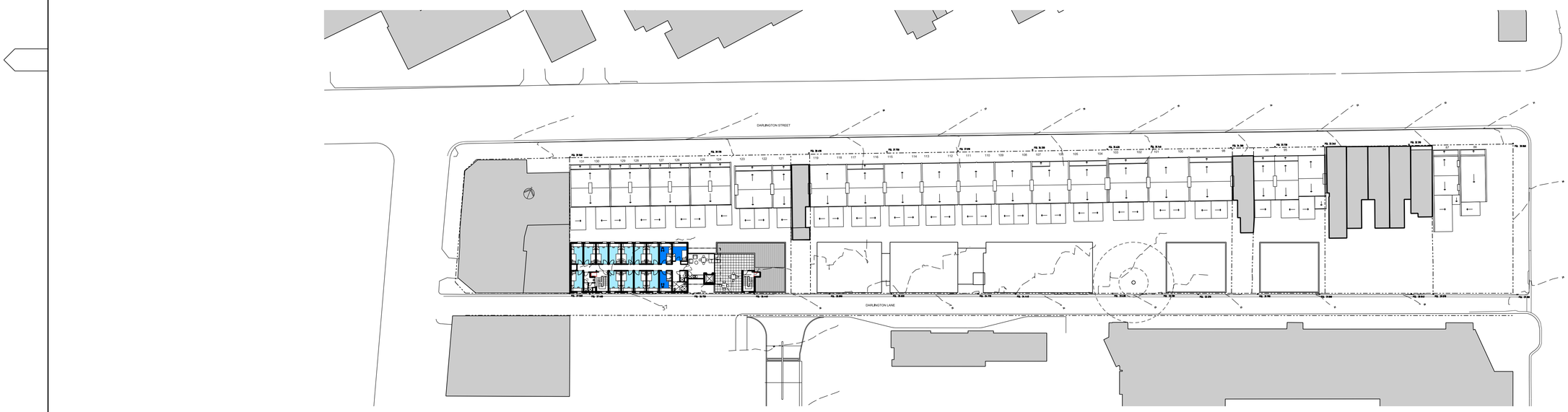

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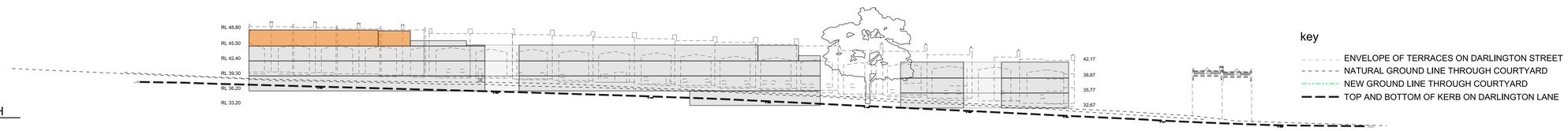

1 ELEVATION SOUTH
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Revisions				
No	Date	Description	Ver	App'd
01	24.02.15	PRELIMINARY ISSUE		

Revisions				
No	Date	Description	Ver	App'd

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Consultants

Architect
AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project
DARLINGTON TERRACES

Proj No.

NORTH

Drawing Title
SITE PLANS
LEVEL 05

Drawing Status
NOT FOR CONSTRUCTION

Scale 1:500

Drawing No DA1003

Issue 01

A1

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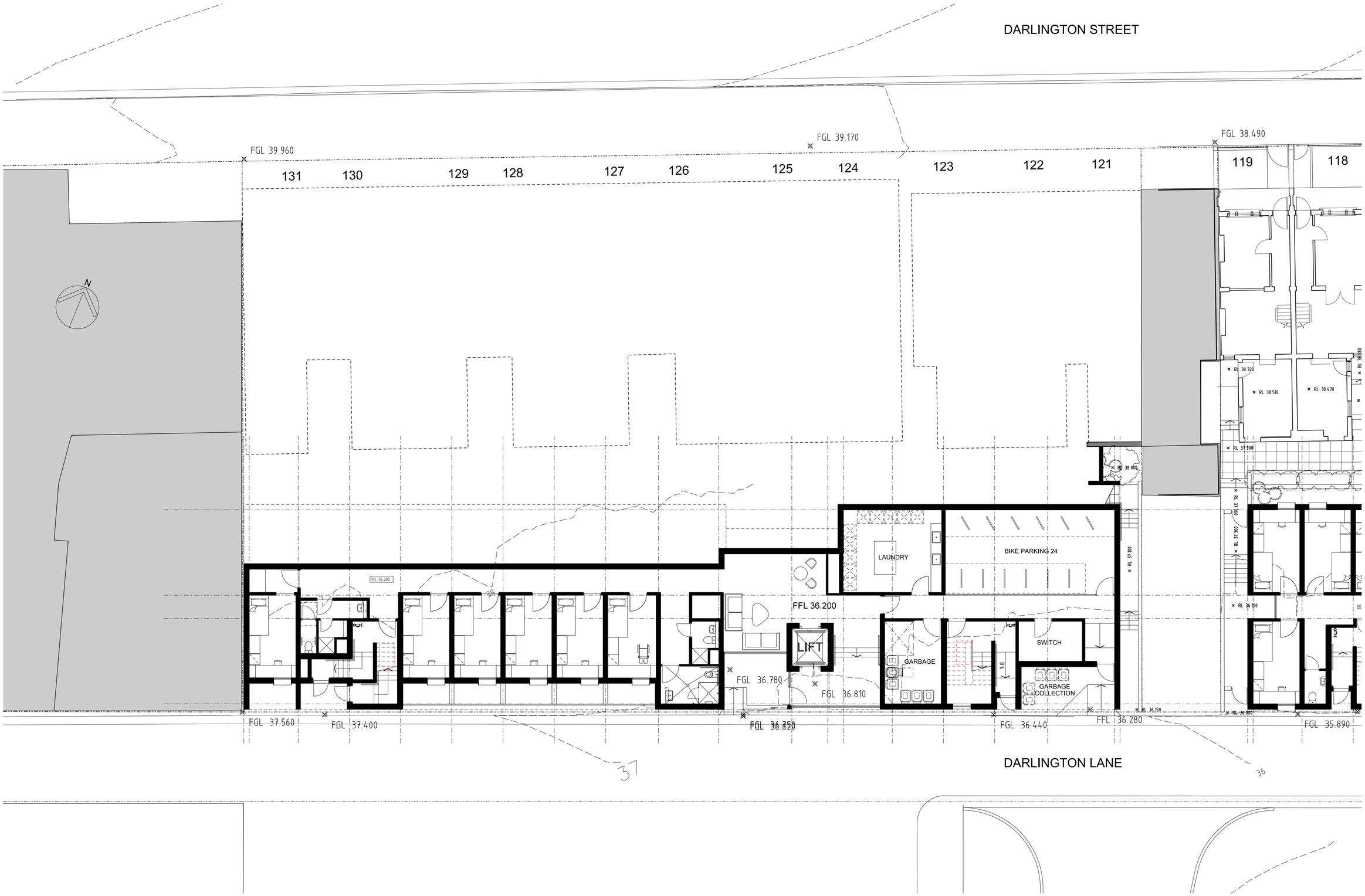

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01	07.11.14	ISSUE FOR COORDINATION		
02	24.02.15	PRELIMINARY ISSUE		

Revisions				
No	Date	Description	Ver	App'd

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Nominated Architects: Michael Heenan 5264, Peter Ireland 6661

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Consultants

Architect
AJ+C
ALLEN JACK+COTTIER
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project
DARLINGTON TERRACES

Proj No.

Drawing Title
FLOOR PLAN BUILDING 'A' - L2

Drawing Status
NOT FOR CONSTRUCTION

Scale 1:100

Drawing No DA2102

Issue 02

A1

REF: P:\2014\14051_DarlingtonRoadTerraces\03_CAD\microstation\sheet_files\14051_DA2102.dgn
PLOT DATE & TIME: 24/02/2015 4:16:30 PM PLOTTED & CHECKED BY: wralhali

Revisions				
No	Date	Description	Ver	App'd
01	07.11.14	ISSUE FOR COORDINATION		
02	24.02.15	PRELIMINARY ISSUE		

Revisions				
No	Date	Description	Ver	App'd

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Nominated Architects: Michael Heenan 5264, Peter Ireland 6661

Key

Client
CIS - THE UNIVERSITY OF SYDNEY

Consultants

Architect
AJ+C
Allen Jack+Cottier
79 Myrtle Street Chippendale NSW 2008 AUSTRALIA
ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project
DARLINGTON TERRACES

Proj No.

NORTH

Drawing Title
FLOOR PLAN
BUILDING 'B' - L1

Drawing Status
NOT FOR CONSTRUCTION

Scale
1:100

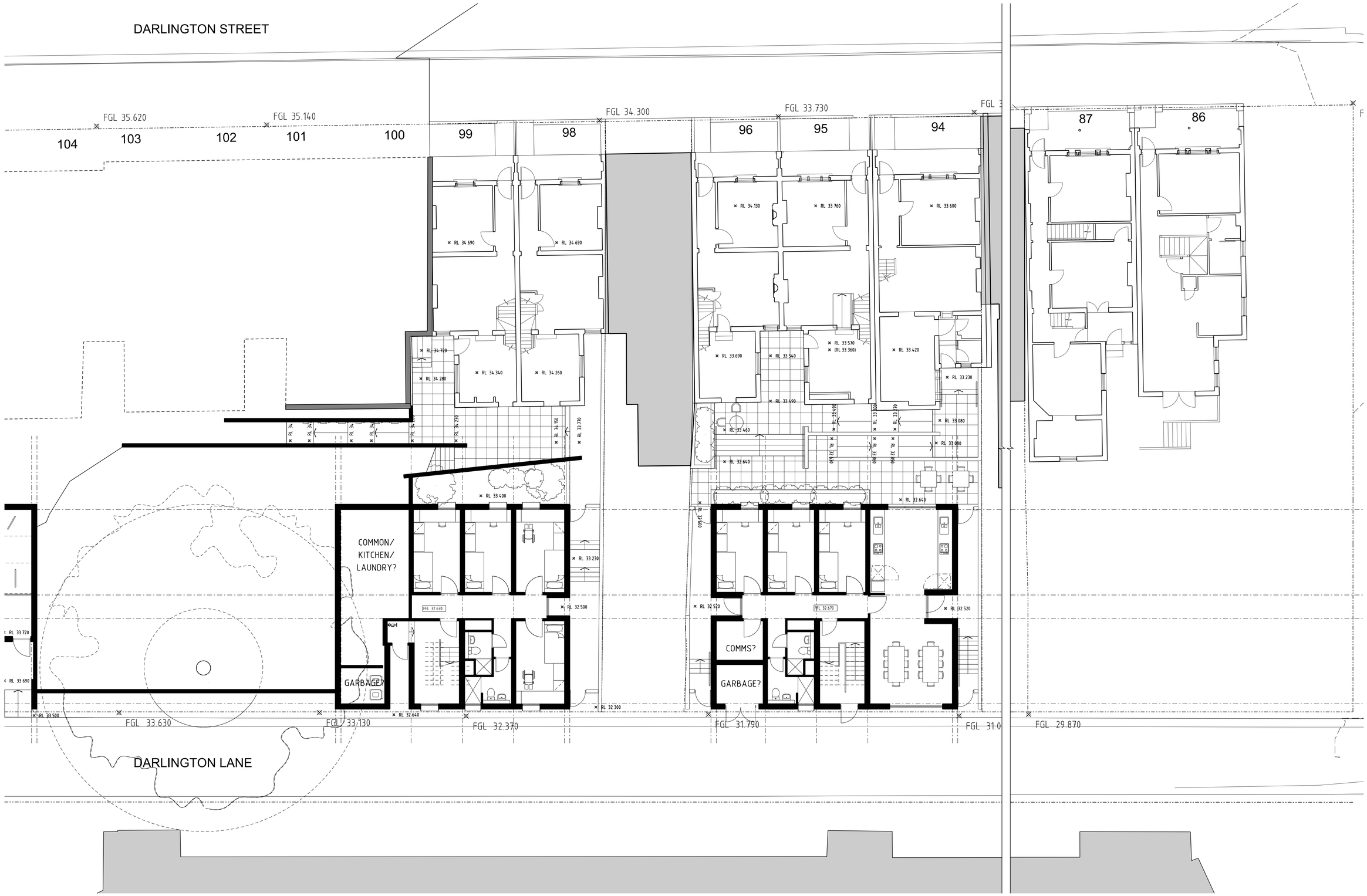
Drawing No
DA2111

Issue
02

A1

PLOT DATE & TIME: 24/02/2015 4:16:24 PM PLOTTED & CHECKED BY: wcathcart

REF: P:\2014\14051_DarlingtonRoadTerraces\03_CAD\vicinicostation\sheet_files\14051_DA2111.dgn



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Architect
AJ+C
Allen Jack+Cottier
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ph +61 2 9311 8222 fx +61 2 9311 8200 ABN 53 003 782 250

Project
DARLINGTON TERRACES

Proj No.

NORTH

Drawing Title
FLOOR PLAN
BUILDING 'C'/'D' - L1

Drawing Status
NOT FOR CONSTRUCTION

Scale 1:100

Drawing No DA2121

Issue 02

A1

PLOT DATE & TIME: 24/02/2015 4:16:17 PM PLOTTED & CHECKED BY: wrolfhall

REF: P:\2014\14051_DarlingtonRoadTerraces\03_CAD\microstation\sheet_files\14051_DA2121.dgn