Detailed Site Investigation

453 – 459 Canterbury Road,
Campsie, NSW

59917080

Prepared for

Hailiang Campsie Pty Ltd

30 August 2017

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Abbreviations and Units

BTEXN	Benzene, Toluene, Ethyl-benzene, Xylenes and Naphthalene
MAH	Monocyclic Aromatic Hydrocarbons
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
SVOC	Semi-Volatile Organic Compounds
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
VOC	Volatile Organic Compounds

Technical Terms

ACM	Asbestos Containing Material
AGL	Above Ground Level
AHD	Australian Height Datum
AMG	Australian Map Grid
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BDL	Below Detection Limit
BGL	Below Ground Level
COC	Chain of Custody
CoPC	Contaminants of Potential Concern
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
DSI	Detailed Site Investigation
EC	Electrical Conductivity
ECe	Electrical Conductivity of the Saturated Extract
EILs	Environmental Investigation Levels
EPA	Environment Protection Authority
EPL	Environment Protection Licence
GCMS	Gas Chromatograph - Mass Spectrometer
GME	Groundwater Monitoring Event
GPR	Ground Penetrating Radar
HILs	Health based Investigation Levels
LDPE	Low-Density Polyethylene
LNAPL	Light Non-Aqueous Phase Liquid
LOR	Limit of Reporting
N/A	Not Applicable
NAPL	Non-Aqueous Phase Liquid
NEPM	National Environment Protection Measure

OEH	Office of Environment and Heritage
ORP	Oxidation-Reduction Potential
PID	Photo-ionisation Detector
PQL	Practical Quantitation Limit
PSH	Phase Separated Hydrocarbon
PSI	Preliminary Site Investigation
QA	Quality Assurance
QC	Quality Control
RL	Reduced Level
RPD	Relative Percentage Difference
SWL	Standing Water Level
UCL	Upper confidence Limit
UST	Underground Storage Tank

Units

Ha	Hectares
mAHD	Metres Australian Height Datum
mBGS	Metres Below Ground Surface
mBGL	Metres Below Ground Level
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mTOC	Metres below Top of Casing
ppb	Part per Billion
ppm	Parts per Million
µg/kg	Microgram per Kilogram (approximately equivalent to ppb)
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre

1 Introduction

1.1 Background

Cardno (NSW/ACT) Pty Ltd ("Cardno") was engaged by Hailiang Property Campsie Pty Ltd ("the Client") to undertake a Detailed Site Investigation (DSI) to assess potential contamination at 453-459 Canterbury Road, Campsie, NSW ("the Site"). The location and features of the Site are shown in **Figures 1** and **2** in **Appendix A**.

The Site has historically been used for residential and light commercial activities, with underground petroleum storage tanks (USTs) believed to remain on Site. The Site's main commercial activities included:

> Automobile storage and maintenance

> The presence of potentially two USTs near the workshop.

Previous environmental investigations at the Site indicated the potential for impacted soil and groundwater to be present, along with asbestos cement building materials. The Site is proposed to be redeveloped to comprise several above ground storeys with one level of basement car parking requiring excavating to a depth of approximately 3 metres below ground level.

This report sets out the findings of the intrusive investigations at the Site.

1.2 Purpose and Objectives

The purpose of this investigation is to provide the Client with advice on the contamination status of the Site and the consequent implications for its intended use.

The objectives of the investigation are to:

> Assess the nature and extent of potential contamination of soil and groundwater at the Site

> Develop the Conceptual Site Model

> Assess the potential for risk to human health and ecological receptors

> Collect data to assist in developing management options for the change in land use at the Site

> Assess the requirement, if any, for further assessment and/or management of potential contamination at the Site.

1.3 Scope

Cardno carried out the following scope of work to meet the objectives of the assessment:

> Reviewed past reports to define the Site, features and surrounds including:

- Defined Site boundaries based on land title information
- Defined Site features including services, main buildings and other infrastructure
- Defined topography, surface water flows and drainage
- Identified nearby sensitive receivers
- Reviewed regional and local geology and hydrogeology.

> Assessed Site conditions and the surrounding environment from the following sources:

- Site inspection to confirm Site features including Site access requirements, potential borehole locations and indicators of contamination
- Review of information provided in the previous reports for the Site.

> Undertook the following intrusive investigations:

- Clearance of the borehole locations using Electronic Detection and Ground Penetrating Radar (GPR)
- Advanced thirteen (13) boreholes within the Site as follows:

  - Eight (8) boreholes to a maximum depth of 3.1 metres below ground level (mBGL) using a drilling rig
  - Two (2) boreholes to a maximum depth of 0.5 mBGL using a hand auger
  - Three (3) boreholes to a maximum depth of 6.3 mBGL and conversion to groundwater monitoring wells.
- Submitted twenty (20) soil samples (plus 2 QAQC samples) to NATA accredited laboratories for analysis of:
  - Total Petroleum Hydrocarbons (TPH)
  - Benzene, Toluene, Ethylbenzene, Xylenes, Naphthalene (BTEXN)
  - Polycyclic Aromatic Hydrocarbons (PAHs)
  - Phenol
  - Heavy metals (arsenic, cadmium, chromium, nickel, zinc, lead, mercury)
  - Organochlorine Pesticides (OCP)
  - Polychlorinated biphenyls (PCBs)
  - Asbestos.
- Submitted three (3) groundwater samples (plus 1 QAQC sample) to NATA accredited laboratories for analysis of:
  - TPH
  - BTEXN
  - PAHs
  - Heavy metals (arsenic, cadmium, chromium, nickel, copper, zinc, lead, mercury)
  - PCBs
  - OCP.
- Prepared this Detailed Site Investigation Report.

1.4 Assessment Timeframe

The key milestones during this assessment are summarised in Table 1-1.

Table 1-1 Site Investigation Timeline

Date	Activity / Milestone
8/12/2016	Cardno engaged by the Client.
17-19/01/2017	Soil sampling and groundwater well installation.
07/02/2017	Groundwater sampling.
24/02/2017	Draft DSI report issued.
30/08/2017	Final DSI report issued.

1.5 Structure of this Report

The structure of this report is as follows:

> **Section1** – introduction

> **Section 2 –** describes the Site condition and surrounding environment

> **Section 3 –** details the investigations undertaken

> **Section 4 –** summarises of contamination assessment criteria

> **Section 5 –** details the results of the laboratory analysis

> **Section 6** – discusses the results and observations

> **Section 7** – provides conclusions and recommendations

> **Section 8** – references.

1.6 Limitations

This assessment has been undertaken in general accordance with the current "industry standards" for a contamination assessment for the purpose, objectives and scope identified in this report. These standards are set out in:

> National Environment Protection Measure (NEPM) - *Assessment of Site Contamination 1999* (NEPC, 1999) as varied May 2013 (the 'NEPM 2013').

> AS4482.1- 2005: Guide to the sampling and investigation of potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds. Standards Australia (2005).

The scope of this assessment is limited to the scope identified in **Section 1.3**. The assessment may not identify contamination occurring in all areas of the Site, or occurring after sampling was conducted. Subsurface conditions may vary considerably away from the sample locations where information has been obtained.

This Document has been provided by Cardno subject to the following limitations:

> This Document has been prepared for the particular purpose outlined in Cardno's proposal and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.

> The scope and the period of Cardno's services are as described in Cardno's proposal, and are subject to restrictions and limitations. Cardno did not perform a complete assessment of all possible conditions or circumstances that may exist at the Site referenced in the Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Cardno in regards to it.

> Conditions may exist which were undetectable given the limited nature of the enquiry Cardno was retained to undertake with respect to the Site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the Site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.

> In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Cardno's opinions are based upon information that existed at the time of the production of the Document. It is understood that the services provided allowed Cardno to form no more than an opinion of the actual conditions of the Site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes in the quality of the Site, or its surroundings, or any laws or regulations.

> Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Document.

> Where data supplied by the client or other external sources, including previous Site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Cardno for incomplete or inaccurate data supplied by others.

> Cardno may have retained sub consultants affiliated with Cardno to provide services for the benefit of Cardno. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any

direct legal recourse to, and waives any claim, demand, or cause of action against, Cardno's affiliated companies, and their employees, officers and directors.

This assessment report is not any of the following:

> A Site Audit Report or Site Audit Statement as defined under the *Contaminated Land Management Act, 1997*.

> A detailed hydrogeological assessment in conformance with NSW DEC (2007) Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination.

> An assessment of groundwater contaminants potentially arising from other Sites or sources nearby.

2 Site Condition and Surrounding Environment

2.1 Site Definition

The Site is located at 453-459 Canterbury Road, Campsie approximately 11 kilometres (km) south-west of the Sydney CBD. The Site location is shown in **Figure 1** in **Appendix A** with Site details presented in **Table 2-1**.

Table 2-1 Site Identification

Item	Details
Site Address	453-459 Canterbury Road, Campsie New South Wales
Approximate Site Area (ha)	0.45
Title Details	Lot 13 and Lot 15 DP 3995 Lot 3 DP 337683 Lot A and Lot B DP 355656 Lot A and Lot B DP 391661 Lot A and Lot B DP 416123
Local Government Area	City of Canterbury-Bankstown Council

2.2 Site Description

The Site comprises light commercial facilities with frontage to Canterbury Road to the south, Stanley Street to the west and low density residential to the north and east. The Site is comprised of a warehouse style building divided into four portions with a separate business operating in each portion. Businesses operating out of the Site include:

- Commercial premises (including a toy shop and grocery store)
- A mechanics workshop
- A mattress factory and associated shopfront.

A Site plan is presented in **Figure 2**, **Appendix A**.

Site surface coverings consist almost entirely of hardstand concrete, with some unsealed car parking areas behind the mechanics workshop and limited areas of landscaping and grass. Light commercial activities (automobile servicing) and storage and distribution of materials is expected to be primarily located within the mechanic workshop and mattress factory within the north-western portion of the Site**.**

An inspection of the Site was undertaken on the 17th of January 2017. Details of observations made during the Site inspection are provided in **Table 2-2**.

Table 2-2 Site Inspection

Item	Observations
Site use	The Site was observed to be used for multiple light commercial activities with a mechanics workshop, mattress production, sales business and commercial premises operating at the time of the inspection.
Site slope and drainage features	The topography was observed to generally slope slightly away from the Site towards the north-east with an approximate elevation of ~26 mAHD at the north-eastern boundary and ~29 mAHD at the south-western. The southern carparking area was observed to be constructed so as to slope slightly towards Canterbury Road to the south. Surface water is collected on roof tops and impervious hardstand surfaces, then channelled via kerb and guttering. Surface water infrastructure was not observed within the north-western portion of the Site, however a drainage system was observed within the north-eastern portion of the Site and within the mechanics workshop. Surface water infiltration is likely to occur through areas of exposed soil within the north-western portion of the Site, as well as cracks and fractures in the hardstand.
Nearby water bodies	Cup and Saucer Creek and the Cooks River are located approximately 640 metres and 1 kilometre to the south and north-east of the Site respectively.
Site surface coverings	The Site is completely covered by hardstand areas in the form of the building slabs, parking areas and pavements with the exception of the north-western portion of the Site adjacent to the mechanics workshop and mattress factory. Hardstand areas were observed to be in moderate to good condition throughout the Site.
Surface soils	Areas of accessible soils are present within the north-western portion of the Site.
Site cut and fill	Fill materials were encountered in the boreholes advanced across the Site and consisted of gravelly sands, sandy clays and clays. Building materials (bricks, ceramic etc.) were observed within fill materials. Refer to **Appendix B** for borehole logs.
Buildings	The Site comprises light commercial facilities with frontage to Canterbury Road to the south, Stanley Street to the west and low density residential to the north and east. The Site is comprised of a concrete and brick warehouse style building divided into four portions with a separate business operating in each portion.
Manufacturing, industrial or chemical processes and infrastructure	Manufacturing of mattresses was observed to be undertaken within the warehouse building, however is not expected to result in soil impacts as operations appeared to primarily consist of stuffing and sewing of mattresses. Operation of the automobile mechanics is expected to include the handling of petroleum and waste oils. Whilst the majority of work is expected to be undertaken within the workshop, which is underlain by a concrete slab, potential for soil impacts due to leakages is possible within the adjacent north-western parking area.
Fuel storage tanks (USTs/ASTs)	Anecdotal evidence of two large (approximately 10,000L) USTs being removed from the north-western portion of the Site was obtained during the Site inspection. Evidence of hydrocarbon contamination was also observed during the advancement of boreholes within the north-western portion of the Site. A small (approximately 1.5m by 1.5 m) structure, potentially a tank, was identified during service location adjacent to the mechanics workshop western roller door.
Dangerous goods	None observed.
Solid waste deposition	None observed.
Drains	A drainage system was observed within the north-eastern portion of the Site and within the mechanics workshop.

Item	Observations
Evidence of previous Site contamination investigations	None observed.
Evidence of land contamination (staining or odours)	Odours were not recorded during the site walkover. However, during the intrusive investigation, hydrocarbon odours and staining were observed within boreholes BH2, BH3, BH4 and MW1 advanced within the north-western portion of the Site.
Evidence of groundwater contamination	None observed.
Groundwater use	None observed.
Vegetation	Minor amounts of landscaped vegetation consisting of native and introduced tree, shrub and grass species were observed adjacent to the Site. The vegetation appeared to be in good condition.
Site fencing	The northern, eastern and southern boundaries to the Site were bound by fencing, with the warehouse building directly abutting the western boundary (frontage to Stanley).

2.3 Surrounding Land Uses

The Site is located within a primarily low density residential area. Land uses around the Site are detailed in **Table 2-3**.

Table 2-3 Surrounding Land Use

Direction	Land Use or Activity
North	Low density residential houses are present to the north-west. An automobile brake distributor is present to the north-east.
East	Low density residential housing, beyond which is an automobile panel workshop.
South	Canterbury Road, beyond which are low density residential houses.
West	Stanley Street, beyond which are low density residential houses and an automobile parts distributor.

The area is serviced by public roads and access to the Site is accessible directly from Canterbury Road or Stanley Street. Public transport is available within the local area via bus and rail services. Canterbury railway station is located approximately 1.3 km to the north-east of the Site.

2.4 Topography and Drainage

The Site has an elevation of approximately 28 mAHD and is relatively flat, grading slightly down to the north-east and south within the southern car parking area. Surface water is expected to be directed via hardstand and limited drainage systems to the kerb and guttering of Canterbury Road. The stormwater drain is likely to be discharged into a regional drainage channel.

2.5 Regional Geology and Hydrogeology

The 1:100,000 Sydney Geological Map Sheet 9130 (Herbert, 1983) shows the Site is situated on the Triassic aged Wianamatta Shale formation, which is known to comprise of black to dark grey shale and laminate. These observations were confirmed during intrusive investigations at the Site, with refusal on shallow shale bedrock encountered within boreholes advanced across the Site.

Stabilised groundwater was encountered from between 1.39 and 2.08 mBGL. Based on inferred groundwater levels, regional groundwater was determined to flow in an easterly to north easterly direction towards the Cooks River.

2.5.1 Groundwater Use

A search of the NSW Office of Water database on 24 February 2017 did not identify registered bores within a 500 meter radius of the site.

2.5.2 Acid Sulfate Soils

Review of the City of Canterbury-Bankstown Local Environmental Plan (2012) does not identify the site as being within an area of known Acid Sulfate Soils. A Class 5 Acid Sulfate Soil Zone is present approximately 400 metres to the east of the Site, with a Class 2 Acid Sulfate Soil Zone present adjacent to the Cooks River. Indicators of acid sulfate soils were not observed during intrusive investigations at the Site.

2.6 Previous Reports

Cardno was provided with the following environmental reports:

- SMEC Testing Services (2014) – Preliminary Geotechnical Assessment
- TRACE Environmental (2014) – Preliminary Site Investigation

A summary of previous reports is provided in **Appendix G**, with key aspects noted below:

- The site has been used for commercial purposes since at least 1971. This included at least two USTs which may potentially remain on Site.
- The site has been used for automobile servicing and maintenance.

2.7 Proposed Development

Specific information regarding the proposed development was not provided at the time of the investigation however it is understood the Site is to be converted to a high density residential landuse.

3 Site Investigations

3.1 Data Quality Objectives

The Data Quality Objective (DQO) process has been used to establish a systematic planning approach to setting the type, quantity and quality of data required for making decisions based on the environmental condition of the Site. The DQO process involves the following seven steps and has been set out in **Table 3-1**.

Table 3-1 Summary of Data Quality Objectives and Indicators

DQO Step	Discussion
Step 1: State the Problem	Current and historical activities at the site included the use of the site as a mechanic workshop, with Underground Storage Tanks (USTs) previously removed. Accordingly, the presence and extent of potential contamination onsite (if any) and potential risks to human health and the environment are unknown. An intrusive investigation including sampling of soils and groundwater has not been undertaken.
Step 2: Identify the decision / goal of the study	1. Are there CoPC detectable in the soil and groundwater associated with current and historic activities at the site? i. Is there any existing data and is this data valid? ii. What are the standard laboratory limits of reporting (LOR) for CoPC in the sample media being assessed? 2. Are there any CoPC impacts within the boundaries of the investigation above laboratory limits of reporting (LOR) for the CoPC? 3. Has the extent of the CoPC impacts to soil and groundwater been identified and determined? 4. Is the investigation approach scientifically suitable and defensible? The decision statement is as follows: Based on the data available, identify whether further assessment, risk assessment or other management measures are required.
Step 3: Identify the information inputs	1. Site history 2. Previous analytical data (if any). 3. Results of analysis undertaken as part of this DSI.
Step 4: Define the boundaries of the study	The boundaries of the study are: 1. Lateral - the sampling of soil and groundwater is limited to the lateral extent of the Site as illustrated in **Figure 2** in **Appendix A**. 2. Vertical – the sampling of soil and groundwater is limited to up to 7mbgl. 3. Temporal - the temporal boundary is the current sampling between January and February 2017.
Step 5: Develop the analytical approach	The investigation program is detailed in **Section 3.2**, with the decision rule that if as: 1. If the laboratory quality assurance/ quality control data are within the acceptable ranges, the data will be considered suitable for use. 2. If the CoPC are reported above the laboratory detection limit in one or more samples, then calculation and review of the following will be used to screen the potential risk: a. 95% upper confidence limit (UCL) of the arithmetic average for that sample type, then compared against the adopted criteria. b. the standard deviation of the data is less than 50% of the adopted criteria. c. the maximum concentration is less than 250% of the adopted criteria 3. If the CoPC are reported below the laboratory detection limit in all samples, then it will be considered that there is no evidence of a potential complete source-pathway-receptor linkage and that further assessment or risk assessment is not required. The decision on the acceptance of the analytical data will be made on the basis of the **Data Quality Indicators (DQI)** as follows: 4. **Precision**: A quantitative measure of the variability (or reproducibility) of data, measured by the calculation of Relative Percentage Differences (RPDs) for duplicate samples (i.e. measure of agreement) as follows:

DQO Step	Discussion
	a. Field and secondary duplicates should be collected at a rate of 1 in 20 samples (NEPC, 2013). b. Percentage of the mean of the measurement such as Relative Percent Difference (i.e. %RPD). The %RPD will be calculated for the field and secondary duplicate (i.e. inter and intra-laboratory analysis); and c. Use of similar analytical method and instrument (e.g. for inter-laboratory assessment. d. The RPDs will be assessed as acceptable if less than 30%. RPDs that exceed this range may be considered acceptable, depending on the closeness to the LOR (<20 times the LOR) or heterogeneity of the material sampled an RPD limit of 50% will be considered acceptable. 5. **Accuracy**: A quantitative measure of the closeness of reported data to the "true" value, as follows: a. Method blanks, which are analysed for the analytes targeted in the primary samples and have analytical results <LOR. b. Matrix spike and matrix spike duplicate sample sets with recoveries between 70-130% of the recovery or as nominated by the laboratory in the laboratory QC report. c. Laboratory control samples (LCS). The LCS consists of a standard reference material or a matrix of known concentration. For the purpose of assessing accuracy it is required that at least one LCS for each process batch be analysed. 6. **Representativeness**: The confidence (expressed qualitatively) that data are representative of each media present on Site and the conditions encountered in the field, with following steps implemented by the laboratory and reviewed by Cardno: a. Blank samples run in parallel with field samples to confirm there are no unacceptable instances of laboratory artefacts. b. Review of RPD values for field and laboratory duplicates to provide an indication that the samples are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities c. The appropriateness of collection methodologies, handling, storage and preservation techniques will be assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods). d. Rinsate samples used when sampling equipment is reused have analytical results <LOR. 7. **Completeness**: A measure of the amount of useable data from the data collected during the fieldwork program, including: a. Whether standard operating procedures (SOPs) for sampling protocols have been adhered to? b. Copies of all chain of custody (COC) documentation are reviewed and presented. It can therefore be considered whether the proportion of "useable data" generated in the data collection activities is sufficient for the purposes of assessing the problem as stated in Step 1 of the DQO process. The DQI for completeness to consider that the data is suitable for use is 95%. 8. **Comparability**: The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event. a. Given that the reported data set can comprise several data sets from separate sampling episodes, issues of comparability between data sets are reduced through adherence to Standard Operating Procedures (SOPs) and regulator endorsed or made guidelines and standards on each data gathering activity. b. In addition was the data collected by experienced Cardno field staff and were NATA accredited laboratory methodologies will be employed in the laboratory programs?
Step 6: Specify performance or acceptance criteria	In accordance with the relevant guidelines as endorsed under the *Contaminated Land Management Act 1997,* specific limits for this project are in accordance with the appropriate guidance made or endorsed by state and national regulations, appropriate indicators of data quality, and standard procedures for field sampling and handling. This step also examines the certainty of conclusive statements based on the available new site data collected and includes the following points to quantify tolerable limits:

DQO Step	Discussion
	1. A decision can be made based on a certainty assumption of 95% confidence in any given data set. A limit on the decision error will be 5% that a conclusive statement may be a false positive or false negative. A decision error in the context of the decision rule presented above would lead to either underestimation or overestimation of the risk level associated with a particular sampling area. Decision errors may include: 1. Sampling errors may occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the site. To address this: a. The SAQP outlined minimum numbers of samples proposed to be collected from each media, as summarised in **Section 3.2**. As such, there may be limitations in the data if aspects of the SAQP cannot be implemented. Some examples of this scenario include but are not limited to: i) Restrictions in borehole depth due to drilling refusal. ii) Proposed samples are not collected due to access being restricted to a given location. 2. Limitations in ability to acquire useful and representative information from the data collected. The data are proposed to be collected from multiple locations and sample media. Some examples of this scenario include but are not limited to: a. Soil samples not being obtained from groundwater wells or at the depth where groundwater is encountered. 3. Measurement errors can occur during sample collection, handling, preparation, analysis and data reduction. To address this the following measures are proposed: b. Field staff to follow a standard procedure when undertaking samples, including decontamination of tools, removal of adhered soil to avoid false positives in results, collection of representative samples and use of appropriate sample containers and preservation methods. c. Laboratories to follow a standard procedure when preparing samples for analysis and undertaking analysis. d. Laboratories to report quality assurance/ quality control data for comparison with the DQIs established for the project
Step 7: Develop the plan for obtaining data.	The work plan is designed to meet the project objectives in Section 1.2 and the DQOs outlined above. The work plan would be optimised based on the ground conditions encountered during the field program.

3.2 Investigation Program

3.2.1 Sampling Strategy and Methodology

The scope and method of the work is summarised in **Table 3-2**. Borehole and monitoring well locations are shown on **Figure 3** in **Appendix A**.

Table 3-2 Investigation Activity Summary

Activity	Details
Dates of Field Activity	Soil sampling - 17 and 18 January 2017. Groundwater sampling – 7 February 2017.
Service Location	A DBYD enquiry was undertake on 12 December 2016 which showed several services on or near the Site. Ausgrid, Jemena, NBN Co, Sydney Water and Telstra utilities are located within, or in areas surrounding, the Site. An underground services locator (Locating Services Pty Ltd) was contracted to locate and clear services in the proposed borehole areas to avoid damage. Manual excavation using a hand auger was also utilised to clear the upper metre prior to advancing boreholes with a drilling rig.
Drilling	Drilling of boreholes was undertaken by a qualified/licensed driller with a track mounted drill rig using a direct push (undisturbed) drilling method.

Activity	Details
	Drilling for monitoring well installation was undertaken using solid flight augers. The drilling contractors were Matrix Drilling.
Bores Drilled and Target Depths	Thirteen (13) boreholes were advanced on the Site (as shown in **Figure 3** in **Appendix A**) and summarised below: 1. Eight (8) boreholes were drilled to a maximum depth of 3.1 mBGL, 2. Two (2) boreholes were advanced to a maximum depth of 0.5 mBGL using a hand auger 3. Three (3) boreholes were drilled to a maximum depth of 6.3 mBGL and converted to groundwater monitoring wells.
Soil Logging	Soils encountered during drilling were described and logged in general accordance with the Unified Soil Classification System. Borehole logs are presented in **Appendix B**.
Soil Sampling	Soil samples were collected from a Geoprobe PTFE liner (disposable Teflon tubes) or directly from the hand auger. Sampling was undertaken using nitrile gloves, with a new pair of gloves used for each sample to minimise the risk of cross-contamination. The soil samples were placed into laboratory supplied sample containers. Soil samples were placed into a cooler box containing ice whilst on-site and in transit to the laboratory. Soil samples were submitted under Chain-of-Custody (CoC) procedures to NATA accredited laboratories. CoC documentation is presented in **Appendix I**. Visual and olfactory observations coupled with PID screening of soil samples were recorded by experienced environmental scientists and documented on the borehole logs presented in **Appendix B**. Based on the field observations, samples were submitted for targeted suites of analysis of the contaminants of potential concern (CoPC) as summarised in **Table 3-3**. The following number of samples were analysed at the laboratories: • Twenty (20) primary soil samples at Eurofins Environmental. • One (1) intra-laboratory duplicate soil sample at Eurofins Environmental. • One (1) inter-laboratory duplicate soil sample at ALS Environmental.
Soil Screening	Soil samples were field screened by using a calibrated PID and noting any odours and any other olfactory signs of contamination. PID calibration records are provided in **Appendix F.**
Groundwater Well Construction	Wells were installed with 50 mm, flush jointed, class 18 PVC, threaded screen and casing. Screen was installed at least 1 m above the observed water level, where possible. Bore construction details are provided in **Appendix B.** Sand filter pack was raised approximately 0.5 m above the top of the screen. Bentonite seal was set an additional 0.5 m above the top of the sand pack. Wells were grout sealed from the bentonite seal to the surface and capped with a concrete-set, flush mounted gatic cover.
Groundwater Sampling	Three (3) new groundwater monitoring wells (MWs) were developed, gauged and sampled. Well Development - developed after drilling and installation using a bailer. Well Gauging - The Static Water Level (SWL) was measured using an interface probe prior to purging and sampling. The interface probe was decontaminated between each measurement with Decon90 and rinsed with tap and deionised water. SWLs were measured from a specified mark on the top of casing on each well, with the SWLs presented as meters below top of casing (mbtoc). Well Purging and Sampling - The monitoring wells were purged using a disposable bailer prior to sampling. Field parameters and visual/olfactory observations were recorded prior to sampling at each location with the exception of monitoring well MW2 which did not have sufficient sample volume. Physio-chemical parameters including pH, EC, redox potential, and temperature were measured using a calibrated water quality meter. Groundwater samples were collected once field parameters stabilised. Groundwater samples were collected directly from the bailer, with a new bailer utilized for each well, and transferred to appropriately preserved sample containers provided by the laboratories. The

Activity	Details
	groundwater samples for metals analysis were field filtered using dedicated disposable 0.45 micron (µm) vacuum filter cups (Stericups™). Field observations and parameters are presented in **Appendix I**. Groundwater samples were placed into a cooler box containing ice (with temperature range between 2-4°C) whilst onsite and in transit to the NATA accredited laboratories for the targeted suite of analysis. Groundwater samples were submitted under CoC procedures to Eurofins Scientific laboratory for suites of analysis of the contaminants of potential concern (CoPC) as per **Section 3.2.2** below. CoC documentation is presented in **Appendix I**.
Decontamination Procedure	Reusable soil and groundwater sampling equipment was rinsed with Decon 90 and deionised water prior to the collection of each sample.
Sample and Preservation and Transport	Samples were placed in laboratory supplied containers and stored on ice in a cooler box while on Site and in transit to the laboratory with accompanying CoC documentation.
Borehole reinstatement	Boreholes which were not converted into monitoring wells were backfilled with soil removed from the bore during drilling to level the area. Concrete cores were reinstated and sealed.
Disposal of excess soil and purged groundwater	Soil cuttings and purged groundwater were stored on site in a sealed waste drum.

Fieldwork was undertaken by experienced environmental scientists. The records and observations made during the fieldwork are presented in the borehole logs and fieldwork records in **Appendix B** and **Appendix H,** respectively.

Tabulated summaries of laboratory results are presented in **Appendix C**. The Quality Assurance/Quality Control program is summarised in **Section 5.5**, with QA/QC documentation presented in **Appendix E**. Copies of the NATA stamped laboratory reports and chain of custody documentation are included in **Appendix I**.

Table 3-3 Summary of samples collected

Environmental Assessment Area	Location	Rationale	Soil Boreholes	Groundwater Wells Installed	Max. Investigation Depths (m)	Sample Media	Contaminants of Potential Concern (CoPC)
Entire Site	Entire Site	Delineate and assess the presence of potential contamination associated with historical land use activities, including operation of USTs and uncontrolled filling, at the Site.	BH1, BH2, BH3, BH4, BH5, BH6, BH7, BH8, BH9, BH10	MW1, MW2, MW3	6.3 mBGL	Soil	TPH, BTEXN, PAH, OCP, PCBs, Total Phenols; Heavy Metals (arsenic, cadmium, chromium, nickel, copper, zinc, lead, mercury); and Asbestos (presence / absence)
						Groundwater	TPH; BTEXN; PAH; PCB; OCP; Heavy metals (arsenic, cadmium, chromium, nickel , copper, zinc, lead, mercury)

4 Assessment Criteria

Cardno understands the Site is proposed to be developed into a high density residential landuse with limited access to soils. The following sections define the criteria adopted, with the criteria values included in the laboratory results summary tables provided in **Appendix C**.

4.1 Soil Assessment Criteria

To determine whether contaminated soil may pose a hazard to human health or the environment, the levels of contaminants reported in the soil are generally assessed against recognised standards and guidelines. Soil assessment criteria for the Site were derived from the following guidelines:

- National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 as varied May 2013 (the 'NEPM 2013')
- Guidelines for Consultants Reporting on Contaminated Sites (OEH, 2011) under the provisions of the Contaminated Land Management Act 1997 (CLM Act).

In December 1999, the National Environment Protection Council (NEPC) formulated the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) in relation to investigation levels for soil and groundwater in the assessment of site contamination (NEPC 1999a). In April 2013, the amendment to NEPM was officially approved (registered on 15 May 2013) with various changes including new ecological and health investigation and screening levels included (NEPC 1999b). This is referred to from now on as "the NEPM". It includes human health and ecological investigation levels (HIL and EIL) for a range of metals, inorganic compounds and organic compounds. Screening levels (HSL and ESL) have been provided for petroleum hydrocarbons. Both the investigation levels and screening levels are applied in the same manner in that they are the upper concentrations of a contaminant above which further investigation is required.

Therefore the beneficial uses and NEPM (NEPC 1999b) assessment criteria commensurate with the site land use(s) are:

- **NEPM Health Investigation/Screening Levels (HIL-B, HSL-B):** Residential with minimal opportunities for soil access and home-grown produce is not grown and consumed. This category includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- **NEPM Management Limits for TRH fractions (Residential, parkland and public open space):** Management limits where high concentrations of low toxicity hydrocarbons may be unacceptable due to the potential for formation of LNAPL, fire and explosive hazard and effects on buried infrastructure by hydrocarbons.
- **NEPM Ecological Investigation / Screening Levels (EIL/ESL):** to assess potential risks to terrestrial ecosystem based on the following generic land use settings:
  - **Urban residential and public open space (UR / POS)**

The initial screening levels for determining the "contamination status of land" are generally the most conservative of these investigation/screening levels applicable for site based on specific soil and site characteristics.

The beneficial use of land referred to as "aesthetics" may be precluded where land is considered offensive to the senses – e.g. through the presence of offensive odour or unusually coloured staining. It is therefore not possible to quantify circumstances where this protected beneficial use is precluded (it is a subjective assessment about how the average person might respond) and as such criteria for the assessment land aesthetics cannot be adopted.

"Investigation levels" or "screening levels" presented in the NEPM are not intended to be interpreted as "maximum permissible levels", "clean up levels" or "safe levels", rather, they are levels at which further investigation or assessment should be undertaken to provide assurance that unacceptable contamination does not occur to an extent that could cause harm or detriment for users of the land. Subsequent assessment on a site-specific basis often results in higher levels being acceptable. However, since the "investigation levels" or "screening level" are generally set at conservatively low levels, they are often taken to be the acceptable levels.

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4.2 Groundwater Assessment Criteria

The use and fate of the groundwater was considered in the selection of assessment criteria. As the Cooks River (which is tidal at this point in the river) is the likely receiving body of water for local groundwater and domestic users of groundwater were noted on the groundwater bore search, these beneficial uses have been used to determine the groundwater assessment criteria for the Site.

The NEPM includes groundwater investigation levels (GIL) for a range of metals, inorganic compounds and organic compounds. Health screening levels (HSL) have been provided for petroleum hydrocarbons. Both the investigation levels and screening levels are applied in the same manner in that they are the upper concentrations of a contaminant above which further investigation is required.

Therefore, the beneficial uses with the site land use(s) and NEPM assessment criteria commensurate to assess whether contaminated groundwater may pose a hazard to human health are:

- **NEPM Groundwater Investigation Levels (GIL):** GIL have been adopted from Australian and New Zealand guidelines for fresh and marine water quality (ANZECC 2000), drinking water (NHMRC & NRMMC 2013) and managing risks from recreational waters (NHMRC 2008). The primary aim of these guidelines is to protection human and ecological health from direct exposure (including consumption) of potentially contaminated groundwater. GILs have been provided for:
  - **Freshwater:** Investigation levels for ecological health where groundwater is received by freshwater surface waters. These levels apply to typical slightly-moderately disturbed systems. Refer to ANZECC (2000) for guidance on applying investigation levels for ecosystem requiring a different level of protection
  - **Drinking water:** investigation levels for the protection of direct human exposure to groundwater used as a source of drinking water.
- **NEPM Groundwater Health Screening Levels (HSL-B) for vapour intrusion:** Residential with minimal opportunities for soil access. This category includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.

In addition, the NEPM stipulates the following guidelines for the risk-based assessment of groundwater contamination depending on the different environmental values to be protected:

- ANZECC 2000 (Freshwater aquatic ecosystem - 95% level of species protection).
- Australian Drinking Water Guidelines 6 Version 3.3 Updated November 2016.

Adopted groundwater assessment criteria for relevant contaminants analysed at the Site are provided in the tables in **Appendix C.**

5 Results

5.1 Field Observations

Ground conditions observed during the sampling program are summarised in **Table 5-1**. Detailed soil descriptions are provided in the borehole logs in **Appendix B**.

Table 5-1 Typical Soil Profile

Generalised Subsurface Horizon	Typical Depth Range (mBGL)	Description
Concrete	0.0 - 0.3	Concrete slab (at BH5, BH6, BH7, BH8 BH9, BH10, MW2 and MW3)
Fill	0.0 – 3.2	Medium to coarse grey and brown gravelly sands with stiff and dry clay areas.
Natural soils and residual soils	0.15 – 1.5	Soft, dry to moist brown to dark brown clays with minor sands.
	0.5 - 6.3	Stiff, low to medium plastic, light brown, orange to brown clayey sands with gravels and of generally moist consistency.

5.1.2 Groundwater Field Parameters

Groundwater field observation and parameters are summarised in **Table 5-2**.

It should be noted that MW2 did not have a sufficient volume of water and the physical parameters were unable to be recorded.

Table 5-2 Groundwater Physical Parameters

Sample ID	Dissolved Oxygen (DO)(1)	Electrical Conductivity (EC)(1)	pH(1)	Redox Potential (Eh)(1)	Temperature(1)	Total Dissolved Solids (TDS)(1)
	mg/L	µS/cm	-	mV	^{0}C	ppm
MW1	-	3640	6.70	155	21.1	-
MW2	-	-	-	-	-	-
MW3	-	1772	7.42	240	22.0	-

5.2 Soil Field Screening Results

Soils samples were screened for total Volatile Organic Compounds (VOCs) using a photo-ionisation detector (PID). The field PID screening VOCs results are provided in the soil borehole logs in **Appendix B.**

The total VOCs concentrations measured using an in-situ PID during the course of the investigation ranged from 0.0 ppm to 21.8 ppm.

5.3 Soil Laboratory Results

The results of laboratory analysis have been compared against the adopted assessment criteria and presented in the Laboratory Summary Tables in **Appendix C**. An interpretation of this data is summarised as follows:

5.3.1 Petroleum Hydrocarbons

- Total Petroleum Hydrocarbons / Total Recoverable (TRH)
  - TRH C_{16}-C_{34} was reported in concentrations ranging from below reportable laboratory LOR to above the following criteria:

- NEPM 2013 ESL Urban Residential / Public Open Space (UR/POS), Fine Soil (1,300 mg/kg) at BH3/1.8 (1,900 mg/kg) and MW1/0.8 (1,700 mg/kg)
- NEPM 2013 Management Limits, R/P&POS, Coarse Soil (2,500 mg/kg) at BH4/1.5 (2,600 mg/kg)
- NEPM 2013 Management Limits, R/P&POS, Fine Soil (3,500 mg/kg) at BH4/2.5 (13,000 mg/kg)
- NEPM 2013 ESL UR/POS, Coarse Soil (300 mg/kg) at BH5/0.2 (410 mg/kg).

o All other TRH and BTEXN compounds were not detected in concentrations exceeding the adopted assessment criteria in any sample analysed.

5.3.2 Pesticides

Organochlorine pesticides were not reported in concentrations exceeding the adopted laboratory LOR in any analysed sample.

5.3.3 Polychlorinated biphenyls

Polychlorinated biphenyls were reported at concentrations below the adopted assessment criteria. Total PCBs (as a sum of total) was reported below the NEPM 2013 HIL, Residential B (1 mg/kg) criterion.

5.3.4 Metals

Metals were reported in concentrations below the adopted assessment criteria, with the following exceptions:

> Arsenic was reported in concentrations exceeding NEPM 2013 EIL UR/POS (100 mg/kg) in BH2/0.5 (350 mg/kg);

> Copper was reported in concentrations exceeding NEPM 2013 EIL UR/POS (60 mg/kg) in BH1/1.0-1.5 (88 mg/kg);

> Zinc was reported in concentrations exceeding NEPM 2013 EIL UR/POS (70 mg/kg) in multiple sampling locations, including BH1/1.0-1.5 (72 mg/kg), BH2/0.5 (240 mg/kg), BH4/1.5 (120 mg/kg), BH5/0.2 (70 mg/kg), BH6/1.2 (500 mg/kg), BH7/0.2 (130 mg/kg), BH8/0.5 (76 mg/kg), MW1/0.8 (150 mg/kg) and MW2/4.0 (500 mg/kg)

> All other metals (cadmium, chromium (III + VI), mercury and nickel) were reported in concentrations below the adopted assessment criteria.

5.3.5 Polycyclic Aromatic Hydrocarbons/Phenols

Concentrations of PAH and phenol compounds analysed were generally less than the adopted assessment criteria, with the exception of:

> Benzo(a)pyrene exceeded NEPM 2013 ESL UR/POS, Coarse Soil (0.7 mg/kg) criteria at BH6/1.2 (2.5 mg/kg), BH8/0.5 (4.3 mg/kg) and MW1/0.8 (0.7 mg/kg).

5.3.6 Asbestos

Asbestos, or respirable fibres, were not detected in the samples submitted for analysis.

Potential asbestos containing material (fibre cement sheet debris) was observed on the soil surface throughout the north-western portion of the Site.

5.4 Groundwater Laboratory Results

The results of laboratory analysis of groundwater samples have been compared against the adopted assessment criteria and presented in the Laboratory Summary in **Appendix C**. An interpretation of this data is summarised as follows:

5.4.1 Physical Parameters

Groundwater physical parameters were measured at each groundwater monitoring well when possible. Specifically:

- Electrical conductivity ranged from 1,541 µS/Cm (sample MW1) to 4,020 µS/Cm (sample MW3)
- pH ranged from acidic (4.55 in sample MW1) to neutral (7.46 in sample MW3)
- Redox potential ranged from 141.16 mV (sample MW1) to 261.6 mV (sample MW3)
- Temperature ranged from 20.3ºC (sample MW1) to 23ºC (sample MW3).

5.4.2 Metals

Dissolved Metals were reported in concentrations exceeding the adopted assessment criteria, as summarised below:

- Dissolved copper was reported in concentrations exceeding the adopted ANZECC criteria in all analysed samples
- Dissolved nickel was reported in concentrations exceeding the adopted drinking water assessment criteria (0.02 mg/L) in sample MW1 (0.029mg/L)
- Dissolved zinc was reported in concentrations exceeding the adopted ANZECC criteria in all analysed groundwater samples.

5.4.3 Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene

Benzene, toluene, ethylbenzene, naphthalene and xylenes were reported in concentrations below laboratory limit of reporting and the adopted assessment criteria in the analysed groundwater samples.

5.4.4 Total Recoverable Hydrocarbons

TRH constituents were reported in concentrations below the laboratory limit of reporting and the adopted assessment criteria in the analysed groundwater samples.

5.4.5 Polycyclic Aromatic Hydrocarbons

PAH compounds were generally reported below the laboratory limit of reporting and the adopted assessment criteria.

5.4.6 Pesticides and Polychlorinated Biphenyls

OCP and PCB compounds were reported below the laboratory limit of reporting and the adopted assessment criteria.

5.5 Quality Assurance / Quality Control

A quality review of the data was conducted. In summary, the data quality review did not identify significant systematic errors in the data collection process. Therefore the data set is considered to be valid, complete and can be relied upon for the purposes of this assessment. RPD values exceeding the accepted limit of 30% were identified and can be found in **Appendix C,** with further discussion on QA / QC provided in **Appendix E**.

5.6 DQO Step Completion

Table 5-3 presents an assessment of how the DQO steps have been completed or otherwise.

Table 5-3 Summary of Data Quality Objectives

DQO Step	DQO Requirement	DQO Completion
Step 1: State the Problem	Further assessment has been undertaken to determine the quality of soil and groundwater across the Site. Thirteen (13) boreholes were advanced on site, three (3) of the boreholes drilled were converted to groundwater monitoring wells to better assess the potential contamination within the Site.	Yes.
Step 2: Identify the decision / goal of the study	Contaminants of potential concern exceeded the adopted assessment criteria for soil and groundwater in some samples across the Site. The majority of soil criteria exceedances were observed within the shallow fill materials primarily around the former UST area and possible waste oil UST.	Yes
Step 3: Identify the information inputs	Previous reports were available and used in this assessment.	Yes
Step 4: Define the boundaries of the study	The contamination assessment was completed within the lateral (site boundary), vertical (shallow soils and rock to approximately 6.3 mBGL and the shallow perched water-table and the temporal boundaries stated in the DQOs.	Yes
Step 5: Develop the analytical approach	Concentrations of the potential contaminants of concern exceeding the adopted assessment criteria were reported for soil and groundwater with analytical data deemed to be precise, accurate, representative, complete and comparable.	Yes
Step 6: Specify performance or acceptance criteria	Analytical data was compared with the relevant guidelines endorsed under the *Contaminated Land Management Act 1997* as stated in **Section 4** and the QAQC limits as specified in **Appendix E**.	Yes
Step 7: Develop the plan for obtaining data.	The field plan was optimised based on review of the previous information and current Site conditions and site observations.	Yes

6 Discussion

6.1 Field Screening

Review of the soil field screening for total VOCs using a PID indicates low concentrations of VOCs at all sampling locations with some hydrocarbon odours detected at BH3, BH4 and MW1 which are located in the vicinity of the former UST area.

6.2 Soil Investigation Results

Concentrations of contaminants of potential concern in soils sampled were generally less than the adopted assessment criteria.

Exceedances of the adopted criteria for TRH fractions were observed at various locations primarily around the former UST area in the north-western portion of the site and the possible UST within the mechanics workshop. There were various exceedances in longer chain TRH (C_{16}-C_{34}) in BH3/1.8 (1,900 mg/kg), BH4/1.5 (2,600 mg/kg), BH4/2.5 (13,000 mg/kg), BH5/0.2 (410 mg/kg) and MW1/0.8 (1,700 mg/kg). There is a large degree of variability in the TRH results, with some of this variability attributed to the nature of the volatility inherent with TRH fractions generally. Given the stability of these longer chain TRH fractions and thus their limited capacity for vapour intrusion, these results are only of concern where dermal and inhalation pathways may be likely, or likely in the future.

Soil concentrations of PAHs exceeding the adopted criteria *NEPM 2013 ESL UR/POS, Coarse Soil* were reported for Benzo(a)pyrene at BH6/1.2 (2.5 mg/kg), BH8/0.5 (4.3 mg/kg) and MW1/0.8 (0.7 mg/kg).

Heavy metals were detected in concentrations exceeding *NEPM 2013 EIL UR/POS, aged* with particular reference to arsenic, copper and zinc. Arsenic exceeded adopted criteria at BH2/0.5 (350 mg/kg) within identified fill material. Copper was also only exceeded the criteria at one location, BH1/1.0-1.5 (88 mg/kg) within the fill material. Zinc exceeded adopted criteria at various locations, BH1/1.0-1.5 (72 mg/kg). BH2/0.5 (240 mg/kg), BH4/1.5 (120 mg/kg), BH5/0.2 (70 mg/kg), BH6/1.2 (500 mg/kg), BH7/0.2 (130 mg/kg), BH8/0.5 (76 mg/kg), MW1/0.8 (150 mg/kg) and MW2/1.0 (500 mg/kg). As such the source for the elevated heavy metals concentrations is expected to be a function of the importation of uncontrolled fill materials and the demolition of onsite structures.

Asbestos fibres were not detected in fill or natural materials however potential asbestos containing materials (fibre cement debris) was observed on the soil surface within the north-western portion of the Site. As asbestos was not observed in building materials, there is the potential for the source to be fill material across the Site.

Given that basement carparking is proposed, it is likely that the soils impacted with petroleum hydrocarbons, metals and Potential Asbestos Containing Material (PACM) will be removed and will require classification for offsite disposal in accordance with the NSW EPA (2014) *Waste Classification Guidelines.* It is noted that the lateral and vertical extent of these impacted soils has not been fully delineated to date.

6.3 Groundwater Investigation Results

Concentrations of contaminants of potential concern in groundwater samples were generally less than the adopted assessment criteria.

Slight exceedances of the adopted ANZECC freshwater criteria for dissolved copper and zinc were observed within the three groundwater monitoring wells sampled, with an exceedances of the adopted drinking water guidelines criteria also reported for nickel in monitoring well MW1. The exceedances are likely to be representative of the surrounding urbanised setting, however elevated concentrations of metals in fill materials may also be contributing to the elevated groundwater concentrations.

6.4 Conceptual Site Model

A Conceptual Site Model (CSM) has been developed for the site to assist with the evaluation of risk of potential contaminants to the environment and human health. The CSM starts with a Conceptual Hydrogeological Model of the site to place the site in context with the groundwater environment and to identify the potential pathways for contamination migration in the sub-surface. The CSM is then developed by assessing the contaminant sources, pathways and receptors to identify the potentially active pathways of exposure or environmental impact.

The CSM development process is also used to identify data gaps, uncertainty and to define the risk assessment approach. The CSM is a blue print (a working hypothesis) for the understanding of site contamination and are updated as new information is obtained.

The CSM presented in this section is based on the findings of the Preliminary Site Investigation (PSI) and this Detailed Site Investigation (DSI), and includes soil and groundwater.

The topography surrounding the Site slopes slightly away towards the Cooks River to the north-east and has an approximate elevation of 26 mAHD. Given the proximity of Cup and Saucer Creek approximately 640 m to the East – South – East of the site, groundwater is expected to flow in this direction.

Drilling across the site encountered Fill comprised of gravely sands, sandy clays and clays with some building materials to approximately 3.2 mBGL within the north-western portion of the Site and 1.0 mBGL within the southern portion. The Fill overlies brown clays followed by black to dark grey shale and laminate at depths from 1.4 mBGL.

Shallow groundwater was present within three monitoring wells with a standing water level of approximately 2.1 mBGL, noting that some water ingress was encountered at approximately 1.38mbgl. Given the clayey soils and shallow bedrock, the groundwater encountered is expected to be perched with limited recharge.

Results of soil sampling indicate that there is the potential for localised soils in the former UST area and the waste oil UST to have been impacted by petroleum hydrocarbons and PAHs.

The infrastructure present on the Site includes several light commercial facilities including a mattress factory, a mechanics workshop with an unsealed car parking area behind, and evidence of two USTs of approximately 10,000L being removed. There is some uncertainty around how many USTs were present in the former UST area, as well as how they have been decommissioned and possibly removed.

Potentially sensitive receivers on the Site and within the surrounding area include:

- Future users of the Site, including residents
- Present and future construction/earthmoving workers involved in the land development and construction
- Future maintenance workers undertaking subsurface maintenance works
- Groundwater under the Site
- Minor vegetation adjacent to the Site
- Receiving water bodies (Cup and Saucer Creek and Cooks River).

Comparison of soil and groundwater analytical results to the adopted assessment criteria identified that metals (Arsenic, Copper and zinc), TRH and Benzo(a)pyrene may pose a risk, albeit low to nearby sensitive ecological receptors. Noting that concentrations in groundwater were less than the adopted assessment criteria with the exception of copper and zinc. Concentrations of nickel exceeding the drinking water guidelines criteria were also reported in sample MW1, however the groundwater is not expected to be used as a drinking water source, given the presence of piped potable water.

The transport pathways between contaminants and potentially sensitive receptors include:

- Vertical migration of contaminants in soil down into groundwater
- Dermal contact with impacted soils during construction, primarily excavation works for basement carparking
- Migration of potentially impacted groundwater to ecological receptors (deep rooted vegetation) and discharge into surface water bodies.

Limited terrestrial vegetation is located adjacent to the site and includes native and introduced trees and grass species on the road verge. The nearest surface water bodies to the Site are Cup and Saucer Creek and Cooks River, located approximately 640 metres and 1 kilometre to the south and north-east of the Site respectively. The majority of the surface areas on the site are hardstand areas, however surface water infiltration is likely to occur through areas of exposed soil within the north-western portion of the site. Accordingly there is limited potential for surface water to infiltrate and assist the vertical migration of hydrocarbons and metals down into the groundwater. A hydraulic connection between groundwater underlying the Site and potentially sensitive receptors has not been established. Given the contaminant concentrations in groundwater are below or close

to the adopted assessment criteria, the risk posed to human health and the environment by impacted groundwater is considered to be low.

6.4.1 Uncertainties

Due to the businesses at the Site remaining operational at the time of the investigation, boreholes were unable to be advanced within the existing building footprint. As such there is the potential for undocumented contamination, particular impacted fill materials and impacts associated with the waste oil UST, to be present under the currently operational areas of the site.

Also there is some uncertainty around how many USTs were present in the former UST area, as well as how they have been decommissioned and possibly removed.

Given the distribution of boreholes across the site and the need to excavate for a basement carpark (if a change in land use is to proceed), it is considered that these uncertainties can be addressed as contingencies in the remediation / construction phase of the project. These contingencies would primarily relate to waste disposal classifications and volumes.

7 Conclusion

7.1 Conclusions

Cardno has completed a Detailed Site (contamination) Investigation at 453-459 Canterbury Road, Campsie, NSW. The purpose of this investigation was to assess and, where possible, delineate the extent of soil and groundwater contamination and provide the Client with advice on the suitability of the Site for the proposed future land-use.

The Site is proposed to be redeveloped to comprise several above ground storeys with one level of basement car parking requiring excavation.

During intrusive soil boring works, fill material was encountered in all locations beneath the concrete slab at depths ranging from 0.1m to 3.3 metres below ground level (mBGL). The fill consisted of dark brown sandy clay and gravely sand. The fill was overlaying soft, dry to moist brown to dark brown clays with minor sands. Low to medium plasticity clayey sands with gravel were observed between 0.5 and 6.3 mBGL. Depths to bedrock varied, with bedrock generally encountered at shallower depths within the southern portion of the Site (approximately 1.4 mBGL to 2.7 mBGL).

Shallow perched groundwater was encountered between the approximately 1.39 mBGL and 2.08 mBGL.

Concentrations of Contaminants of Potential Concern in soils and groundwater were generally less than the adopted assessment criteria, with the exception of the following,

- TRH concentrations exceeded the adopted Ecological Screening Level ESL in boreholes BH3 and MW 1 at depths of 1.8 and 0.8 mBGL respectively. TRH in sample location BH4 exceeded management limits at depths of 1.5 mBGL and 2.5 mBGL.
- Benzo(a)pyrene exceeded NEPM 2013 Ecological Screening Level for an Urban Residential / Public Open Space land use setting at BH6/1.2 (2.5 mg/kg), BH8/0.5 (4.3 mg/kg) and MW1/0.8 (0.7 mg/kg).
- Elevated concentrations of arsenic, copper and zinc were reported in some samples, while all other metals remain below adopted assessment criteria. Exceedances of the adopted Ecological Investigation Levels for heavy metals were generally observed in fill materials to a depth of 1.5 mBGL.
- Slight exceedances of the adopted ANZECC freshwater criteria for dissolved copper and zinc were observed within the three groundwater monitoring wells sampled, with an exceedance of the adopted drinking water guidelines criteria also reported for nickel in monitoring well MW1. Given the substantial distance of the site to sensitive groundwater receptors, the slightly elevated metal concentrations are unlikely to pose a risk to human health or the environment.

7.2 Recommendations

To confirm the suitability of the site for the proposed change in landuse, it is recommended that the following be undertaken during the redevelopment and prior to occupancy:

- The lateral and vertical extent of the hydrocarbon, metal and asbestos impacted soils be delineated. The delineation assessment should consider the proposed stages of excavation and waste classification requirements for the offsite disposal of this material, if it cannot be re-used onsite.
- A Remediation Action Plan (RAP) incorporating the further contamination assessment and building design be developed. The RAP should include an Unexpected Finds Protocol and options for spoil management. The RAP should be prepared in accordance with the Site's final and approved detail structural building envelope design plans. Options for spoil management should be developed prior to construction commencing at the Site, and in consultation with Cardno and a Licensed Asbestos contractor.
- A soil validation assessment should be carried out at the completion of excavation and dewatering (if required) phases. This assessment could be undertaken as per the recommendations that will be provided in the RAP.

8 References

SMEC Testing Services (2014) – *Preliminary Geotechnical Assessment*, 453-459 Canterbury Road, Campsie NSW

TRACE Environmental (2014) – *Preliminary Site Investigation*, 453-459 Canterbury Road, Campsie NSW

453 – 459 Canterbury Road, Campsie, NSW

APPENDIX A

FIGURES

AILIANG

Regional & Vicinity Map

453-459 CANTERBURY ROAD,
CAMPSIE NSW
DETAILED SITE INVESTIGATION

FIGURE 1

Legend

- Site Boundary
- Waterways
- Roads
- Railway

N

1:20,000Scale at A4

Metres

0 125 250 500 750

Cardno

Map Produced by Cardno (NSW/ACT) Pty Ltd (W&E)
Date: 2017-01-09
Coordinate System: GDA 1994 MGA Zone 56
Project: 59917080_Detailed Site Investigation
Map: 59917080_GS001_Reg&Vic.mxd 01

AILIANG

Site Plan

453-459 CANTERBURY ROAD,
CAMPSIE NSW
DETAILED SITE INVESTIGATION

FIGURE 2

Legend

- Potential Waste Oil UST
- Presumed Former UST Location
- Site Boundary
- Elevation Contours
- Roads

N

1:1,000 Scale at A4

Metres

0 5 10 20 30

Cardno

Map Produced by Cardno (NSW/ACT) Pty Ltd (W&E)
Date: 2017-02-24
Coordinate System: GDA 1994 MGA Zone 56
Project: 59917080_Detailed Site Investigation
Map: 59917080_GS002_SitePlan.mxd 01

AILIANG

Borehole Locations

453-459 CANTERBURY ROAD,
CAMPSIE NSW
DETAILED SITE INVESTIGATION

FIGURE 3

Legend

- Soil Boring
- Installed Groundwater Monitoring Well
- Potential Waste Oil UST
- Observed Area of UST Impact
- Site Boundary
- Roads

N

1:650 Scale at A4

Metres
0 5 10 20

Cardno

Map Produced by Cardno (NSW/ACT) Pty Ltd (W&E)
Date: 2017-02-24
Coordinate System: GDA 1994 MGA Zone 56
Project: 59917080_Detailed Site Investigation
Map: 59917080_GS004_BHLoc.mxd 01

453 – 459 Canterbury Road, Campsie, NSW

APPENDIX B

BOREHOLE LOGS

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH1
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL				
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.10m Fill, clayey SAND, loose, low plasticity, grey	D	L	
		BH1_1.0-1.5 PID =0.2		1.0			Fill, sandy CLAY, soft, medium to high plasticity, dark brown, with gravel	M	S	
		PID =0.4					1.50m Fill, gravely SAND, loose, coarse, grey 1.80m	D	L	
				2.0			Natural, sandy CLAY, stiff, low to medium plasticity, red, with gravel 2.40m	M - W	St	
		BH1_2.4 PID=1.6					Natural, CLAY, stiff, medium plasticity, grey with orange	D - W	St	
		PID=0.2		3.0			3.10m Refusal at 3.1 m			
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH2
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL				
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.10m Fill, gravelly SAND, loose, coarse, grey	D	L	
		BH2_0.5 PID= 0.3					Fill, SAND, loose, coarse, red brown, with gravel 0.80m	D	L	
							Fill, sandy CLAY, firm, medium plasticity, brown 1.00m	D	F	
		PID = 0.3		1.0			Fill, SAND, loose, coarse, light brown, with gravel	D	L	
		PID = 0.2					1.80m			
		2.00m PID = 0.3		2.0			Fill, CLAY, soft, medium plasticity, brown with red mottle 2.20m	M - W	S	
							Natural, CLAY, firm, low to medium plasticity, orange, with gravel	M - W	F	
		BH2_2.4 PID = 0.2		3.0			3.10m			
							Refusal at 3.1 m			
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
- D - Dry
- M - Moist
- W - Wet
- OMC - Optimum MC
- PL - Plastic Limit
- ▶— - Water seepage/inflow
- ▼ - Water level

SAMPLES & FIELD TESTS
- U - Undisturbed Sample
- D - Disturbed Sample
- ES - Environmental sample
- B - Bulk Disturbed Sample
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer

CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

ROCK STRENGTH
- EL - Extremely low
- VL - Very low
- L - Low
- M - Medium
- H - High
- VH - Very high
- EH - Extremely high

ROCK WEATHERING
- RS - Residual soil
- XW - Extremely weathered
- DW - Distinctly weathered
- SW - Slightly weathered
- FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH3
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.10m Fill, gravely SAND, loose, coarse, grey	D	L	
		PID= 0.5					Fill, SAND, loose, coarse, dark brown, with gravel	D	L	
		PID=0.3		1.0			1.20m			
		PID= 21.8					Fill, CLAY, stiff, low plasticity, dark brown	M	St	Slight hydrocarbon odour
		PID=10.0					1.60m Fill, CLAY, soft, medium to high plasticity, dark brown	M	S	Slight hydrocarbon odour
		BH3_1.8 PID=1.5		2.0			2.00m Natural, CLAY, soft, medium plasticity, brown,	M	S	Slight hydrocarbon odour
		BH3_3.0 PID=0.3		3.0			2.80m Natural, CLAY, firm, low plasticity, red	D	F	
							3.30m Natural, CLAY, stiff, low to medium plasticity, grey	D	St	
				4.0			4.10m Refusal at 4.1 m			
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
- D - Dry
- M - Moist
- W - Wet
- OMC - Optimum MC
- PL - Plastic Limit
- ▶— - Water seepage/inflow
- ▼ - Water level

SAMPLES & FIELD TESTS
- U - Undisturbed Sample
- D - Disturbed Sample
- ES - Environmental sample
- B - Bulk Disturbed Sample
- SPT - Standard Penetration Test
- HP - Hand/Pocket Penetrometer

CONSISTENCY
- VS - Very Soft
- S - Soft
- F - Firm
- St - Stiff
- VSt - Very Stiff
- H - Hard

RELATIVE DENSITY
- VL - Very Loose
- L - Loose
- MD - Medium Dense
- D - Dense
- VD - Very Dense

ROCK STRENGTH
- EL - Extremely low
- VL - Very low
- L - Low
- M - Medium
- H - High
- VH - Very high
- EH - Extremely high

ROCK WEATHERING
- RS - Residual soil
- XW - Extremely weathered
- DW - Distinctly weathered
- SW - Slightly weathered
- FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH4
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.10m Fill, gravelly SAND, loose, coarse, grey	D	L	
							Fill, gravelly SAND, loose, coarse, dark brown, with gravel	D	L	
				1.0			1.00m Fill, sandy CLAY, very soft, low plasticity, dark brown	W	VS	Hydrocarbon odour
		BH5_1.5								
				2.0			2.20m Fill, sandy CLAY, very soft, low plasticity, dark brown, with gravel		VS	Strong hydrocarbon odour
		BH4_1.6 PID= 8.3					2.60m Natural, CLAY, firm, medium plasticity, orange	D - M	F	
				3.0			2.90m Refusal at 2.9 m			
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH5
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : N/A | METHOD : Hand Auger | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
		BH5_0.2		0.0			0.13m Concrete Slab Fill, gravelly SILT, loose, coarse, with clay 0.50m Refusal at 0.5m, Brick		L	Bricks
				1.0						
				2.0						
				3.0						
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH6
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 17/1/17 | DATE COMPLETED : 17/1/17 | DATE LOGGED : 17/1/17 | LOGGED BY : PN | CHECKED BY : SD

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.13m Concrete Slab			
		PID=0.2					Fill, SAND, coarse, loose, dark brown, with gravel	M	L	
							0.60m			
		PID=0.0					Fill, CLAY, firm, medium plasticity, brown, with gravel and sand	D	F	
				1.0			1.00m			
		PID=0.0					Fill, CLAY, very soft, medium plasticity, brown, with gravel	W	VS	
		BH6_1.2					1.20m			
							Fill, CLAY, stiff, low, dark brown to black, with gravel	D	St	
							1.80m			
		BH6_1.8					Fill, CLAY, firm, medium plasticity, brown with red motttle	D	F	
				2.0			2.30m Natrual, CLAY, stiff, low plasticity, orange with red and grey mottle	D	St	
							2.70m			
							Refusal at 2.7 m , rock encountered			
				3.0						
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH8
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 17/1/17 | DATE COMPLETED : 17/1/17 | DATE LOGGED : 17/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			Concrete slab 0.20m			
		BH8_0.5 PID= 0.0		1.0			Natural, sandy CLAY, firm, low plasticity, brown, with gravel and sand 1.20m	D	F	
		PID= 0.0					Natural, CLAY, soft, medium plasticity, brown with red mottle 1.40m	M	S	
		BH8_1.6					Natural, CLAY, very soft, high plasticity, grey 1.60m	W	VS	
		PID= 0.0		2.0			Borehole BH8 terminated at 1.60 m			Weathered bedrock
				3.0						
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH9
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 17/1/17 | DATE COMPLETED : 17/1/17 | DATE LOGGED : 17/1/17 | LOGGED BY : PN | CHECKED BY : SD

LOCATION : See Drawing for location

DRILLING					MATERIAL				
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.15m Concrete slab			
		BH9_1.0 PID=0.5					Natural, silty CLAY, soft, low plasticity, dark brown, with gravel	M	S	
				1.0			1.00m			
		BH9_1.3 PID=0.1					Natural, CLAY, firm, low plasticity, brown	D	F	
							1.40m Refusal at 1.4 m			
				2.0						
				3.0						
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : BH10
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 17/1/17 | DATE COMPLETED : 17/1/17 | DATE LOGGED : 17/1/17 | LOGGED BY : PN | CHECKED BY : SD

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			Concrete slab 0.20m			
		PID= 0.0					Fill, SAND, loose, coarse, yellow, with gravel 0.30m	D	L	
		PID= 0.0					Fill, silty CLAY, soft, low plasticity, dark brown, dry , with charcoal 0.50m	D	S	
							Natural, CLAY, firm, low plasticity, grey 0.80m	D	F	
				1.0			Natrual, CLAY, firm, low plasticity, red with grey mottle 1.80m	D	F	
				2.0			Natural, CLAY, firm, low plasticity, brown with red mottle, with sand 2.10m	D	F	
							Refusal at 2.1 m			
				3.0						
				4.0						
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : MW1
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.10m Fill, gravely SAND, loose, coarse grained, grey	D	L	
		PID =0.3					Fill, gravely SAND, loose, coarse grained, dark brown, with gravel 0.40m	D	L	
		PID =0.3					Fill, sandy CLAY, soft, medium plasticity, dark brown,			Hydrocarbon odour
		MW1_1.0 PID=1.5		1.0						
		MW1_1.0 PID= 0.3						M	VS	
				2.0						
				3.0			3.20m			
							Natural, CLAY, soft, medium plasticity , light brown	D	S	
		MW1_4.0 PID=3.5		4.0			4.20m			
							Natural, CLAY, soft, medium plasticity, red	D	S	
				5.0			5.00m			
							NAtural, CLAY, firm, low plasticity , red brown	D	F	
				6.0			6.30m			
							Borehole MW1 terminated at 6.30 m			
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : MW2
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 17/1/17 | DATE COMPLETED : 17/1/17 | DATE LOGGED : 17/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.13m Concrete Slab 0.15m Fill, SAND, Low Plasticity , yellow brown mottle			
		PID=0.0					Fill, gravely SAND, loose, low plasticity, dark brown 0.40m		L	
		PID=0.0					Fill, CLAY, firm, medium plasticity, brown, with sand and gravel	D	F	
				1.0			1.00m			
		PID=0.0					Natural, sandy CLAY, firm, low to medium plasticity, dark brown	M	F	
				2.0			2.00m			
		PID=0.1					Natural, CLAY, stiff , medium plasticity, brown, with gravel	M	St	
				3.0						
				4.0			4.00m			
							Natural, CLAY, very loose , light brown 4.50m	D	VL	
							Refusal at 4.5 m			Weathered Bedrock
				5.0						
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

BOREHOLE LOG

CLIENT : Hailiang Property Campsie Pty Ltd
PROJECT : Campsie DSI
LOCATION : 453-459 Canterbury Road, Campsie NSW

HOLE NO : MW3
PROJECT REF : 59917080
SHEET : 1 OF 1

RIG TYPE : Geoprobe 7822DT | METHOD : Push Tube | CONTRACTOR : Matrix Drilling | DRILLER :

DATE STARTED : 18/1/17 | DATE COMPLETED : 18/1/17 | DATE LOGGED : 18/1/17 | LOGGED BY : SD | CHECKED BY : HS

LOCATION : See Drawing for location

DRILLING					MATERIAL					
METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
				0.0			0.10m Concrete Slab			
							Fill, gravelly SAND, loose, coarse, dark brown to black			Bricks/ building rubble
		MW3_0.8		1.0				D	L	
							1.50m			
							Natural, CLAY, soft, light brown			Weathered Bedrock
				2.0						
		MW3_3.0		3.0				D	S	
				4.0						
				5.0			5.40m			
							Refusal at 5.9 m			
				6.0						
				7.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶— - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
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ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

453 – 459 Canterbury Road, Campsie, NSW

APPENDIX C

LABORATORY SUMMARY TABLES

Table 1
ANALYTICAL SOIL SUMMARY TABLE
PROJECT (59917080)

Campsie, NSW

											Site ID	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001	001			
											Field ID	BH1_1.0-1.5	BH1_2.4	BH10_1.8	BH2_0.5	BH2_2.4	BH3_1.8	BH3_3.0	BH4_1.5	BH4_2.5	BH5_0.2	BH6_1.2	BH6_1.8	BH7_0.2	BH8_0.5	BH9_1.0	MW1_0.8	MW1_4.0	MW2_1.0	MW2_4.5	MW3_0.8	QA1	QA2			
											Sample Code	S17-Ja09853	S17-Ja09854	S17-Ja09861	S17-Ja09855	S17-Ja09856	S17-Ja09859	S17-Ja09860	S17-Ja09857	S17-Ja09858	S17-Ja09852	S17-Ja09864	S17-Ja09865	S17-Ja09848	S17-Ja09863	S17-Ja09862	S17-Ja09849	S17-Ja09850	S17-Ja09866	S17-Ja09867	S17-Ja09851	S17-Ja09868	ES1701520001			
											Sample Depth	1.25	2.4	1.8	0.5	2.4	1.8	3	1.5	2.5	0.2	1.2	1.8	0.2	0.5	1	0.8	4	1	4.5	0.8	0.8	0.8			
				NEPM 2013 EIL UR/POS, low pH, CEC, clay content aged	NEPM 2013 ESL UR/POS, Coarse Soil	NEPM 2013 HIL, Residential B	NEPM 2013 Soil HSL Residential A&B, for Vapour Intrusion, Clay				NEPM 2013 Management Limits, R/P&POS, Coarse Soil																							Statistical Summary		
			LOR	0-2m	0-2m		0-1m	1-2m	2-4m	>4m																								Maximum	Average	Standard
BTEX	Benzene	mg/kg	0.1		50		0.7	1	2	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	0
	Toluene	mg/kg	0.1		85		480	NL	NL	NL		<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	<0.5	<0.5	<0.5	0
	Ethylbenzene	mg/kg	0.1		70		NL	NL	NL	NL		<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	<0.5	<0.5	<0.5	0
	Xylene (m & p)	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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	0
	Xylene (o)	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	0
	Xylene Total	mg/kg	0.3		105		110	310	NL	NL		<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	<0.5	<0.5	<0.5	0
	Total BTEX	mg/kg	0.2									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	
TRH	C6 - C9	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	<10	20	20	2
	C10 - C14	mg/kg	20		120						1000	<20	<20	<20	<20	<20	<20	<20	29	190	20	<20	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<50	190	30	36
	C15 - C28	mg/kg	50									<50	<50	<50	<50	<50	1100	70	1600	7900	310	96	<50	100	200	56	1000	220	77	<50	89	66	<100	7900	606	1681
	C29-C36	mg/kg	50									<50	<50	<50	<50	<50	1100	50	1500	7200	170	<50	<50	<50	<50	<50	960	190	<50	<50	<50	<50	<100	7200	544	1540
	+C10 - C36 (Sum of total)	mg/kg	50									<50	<50	<50	<50	<50	2200	120	3129	15,290	500	96	<50	100	200	56	1960	430	77	<50	89	66	<50	15290	1123	3274
CRC Care TRH Fractions	C6-C10	mg/kg	20								700	<20	<20	<20	<20	<20	<20	<20	<20	31	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<10	31	20	3
	C10-C16	mg/kg	50		120						1000	<50	<50	<50	<50	<50	<50	<50	<50	240	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	240	59	41
	C16-C34	mg/kg	100		300						2500	<100	<100	<100	<100	<100	1900	<100	2600	13,000	410	120	<100	110	190	<100	1700	350	<100	<100	<100	<100	<100	13000	985	2772
	C34-C40	mg/kg	100		2800						10000	<100	<100	<100	<100	<100	680	<100	900	4700	<100	<100	<100	<100	<100	<100	600	110	<100	<100	<100	<100	<100	4700	395	987
	C10 - C40 (Sum of total)	mg/kg	50									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50		
	F1: C6-C10 less BTEX	mg/kg	20		180		50	90	150	290		<20	<20	<20	<20	<20	<20	<20	<20	31	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<10	31	20	3
	F2: >C10-C16 less Naphthalene	mg/kg	50				280	NL	NL	NL		<50	<50	<50	<50	<50	<50	<50	<50	240	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	240	59	41
PAH	Benzo(b+j)fluoranthene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.1	<0.5	<0.5	4.9	<0.5	0.7	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	4.9	0.84	1
	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	<0.5	<0.5	<0.5	0
	Acenaphthylene	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	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	0.5	0.2
	Anthracene	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	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	0.6	0.3
	Benz(a)anthracene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	<0.5	4.9	<0.5	0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	4.9	0.8	1
	BaP TEQ (zero)	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	<0.5	6.8	<0.5	0.9	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	6.8	1	1.5
	Benzo(a) pyrene	mg/kg	0.5		0.7							<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.5	<0.5	<0.5	4.3	<0.5	0.7	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	4.3	0.8	0.9
	Benzo(a)Pyrene TEQ (half LOR)	mg/kg	0.5			4						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6		
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.2		
	Benzo(a)pyrene TEQ (medium bound)*	mg/kg	0.5									0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	3.7	0.6	0.6	6.8	0.6	1.2	0.6	1.1	0.6	0.6	0.6	-	6.8	1.1	1.5
	Benzo(a)pyrene TEQ (upper bound)*	mg/kg	0.5									1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	4	1.2	1.2	6.8	1.2	1.5	1.2	1.4	1.2	1.2	1.2	-	6.8	1.6	1.3
	Benzo(g,h,i)perylene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.6	<0.5	<0.5	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3	0.7	0.7
	Benzo(k)fluoranthene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	<0.5	3.7	<0.5	0.7	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	3.7	0.7	0.8
	Chrysene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	<0.5	4.1	<0.5	0.7	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	4.1	0.8	0.8
	Dibenz(a,h)anthracene	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	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.5	0.1
	Fluoranthene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	4	<0.5	<0.5	12	<0.5	1.2	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	12	1.3	2.5
	Fluorene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<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	0.7	0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	2.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	0.7	0.5
	Naphthalene	mg/kg	0.5	170			5	NL	NL	NL		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 - 0.8	<0.5	<0.5	<0.5 - 1.7	<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	1.7	0.5	0.1
	PAHs (Sum of total)	mg/kg	0.5			400						<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	5.7	<0.5	25.9	<0.5	<0.5	61.8	<0.5	6.8	<0.5	6.4	<0.5	<0.5	<0.5	-	61.8	5.5	14
	Phenanthrene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	1.2	<0.5	<0.5	8.1	<0.5	0.9	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	8.1	1	1.6
	Pyrene	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	4.1	<0.5	<0.5	10	<0.5	1.4	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	10	1.2	2.1
Asbestos	FA- Comment	Comment										1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	0
	Synthetic Fibres - Comment	Comment										1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	0
	Approximate Sample Mass	g										32	60	40	49	89	33	40	45	46	14	35	131	24	78	34	33	36	95	45	30	63	-	131	50	28
	Asb (Presense/Absense)	(Y/N)										N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	-	0		
Metals	Arsenic	mg/kg	2	100		500						19	8.9	<2	350	13	9.4	15	32	6.2	6.4	14	9.6	8.2	6.4	11	11	13	5.3	11	8.9	10	8	350	26	73
	Cadmium	mg/kg	0.4			150						<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.7	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1	<1	<1	0.1
	Chromium (III+VI)	mg/kg	5									16	9.5	5.9	8.9	46	30	53	24	21	6.7	33	26	23	16	26	17	11	13	7.4	6.9	7.6	6	53	19	13
	Copper	mg/kg	5	60		30000						88	11	6.2	45	7	9.2	6.2	33	21	37	26	<5	11	13	5.4	33	33	48	19	22	28	22	88	24	19
	Lead	mg/kg	5	1100		1200						32	15	15	63	27	31	29	220	170	24	240	20	160	180	25	110	25	300	430	71	87	61	430	106	111
	Mercury	mg/kg	0.1			120						<0.1	<0.1	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.9	0.1	<0.1	<0.1	<0.1	0.9	0.2	0.2
	Nickel	mg/kg	5	30		1200						6.6	<5	<5	8.6	<5	5.6	<5	<5	6.1	12	9.1	<5	<5	<5	<5	6.4	<5	5.1	5.2	16	15	12	16	7.2	3.5
	Zinc	mg/kg	5	70		60000						72	<5	<5	240	6.7	6.4	9.3	120	270	70	500	<5	130	76	5.8	150	20	500	350	55	68	60	500	124	154
Phenols	2,4-dimethylphenol	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	<0.5	<0.5	<0.5	0
	2-methylphenol	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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	0.1
	2-nitrophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	0.11
	3-&4-methylphenol	mg/kg	0.4									<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<1	<1	<1	0.13
	4-chloro-3-methylphenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	0.11
	Phenol	mg/kg	0.5			45000						<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	<0.5	<0.5	0
Halogenated Phenols	2,4,5-trichlorophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	0.11
	2,4,6-trichlorophenol	mg/kg	1									<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.5	<1	<1	0.11
	2,4-dichlorophenol	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	<0.5	<0.5	<0.5	0
	2,6-dichlorophenol	mg/kg	0.5									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	
	2-chlorophenol	mg/kg	0.5									<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<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	1.8	0.6	0.3
	Pentachlorophenol	mg/kg	1			130						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<2	<2	0
Organochlorine Pesticides	4,4-DDE	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	Aldrin + Dieldrin	mg/kg	0.05			10						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	0
	Chlordane (cis)	mg/kg	0.05									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	
	Chlordane (trans)	mg/kg	0.05									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	DDD	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	DDT	mg/kg	0.05	180								<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	0
	DDT+DDE+DDD	mg/kg	0.05			600						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	Endosulfan	mg/kg	0.05			400						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	Endosulfan sulphate	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0
	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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0
	Toxaphene	mg/kg	1			30						<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	0
Polychlorinated Biphenyls	Arochlor 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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0
	Arochlor 1221	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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	0
	Arochlor 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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0
	Arochlor 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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0
	Arochlor 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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0
	Arochlor 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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0
	Arochlor 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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0
	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	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	0

Cardno
Shaping the Future

ANALYTICAL WATER SUMMARY TABLE
CAMPSIE

Campsie, NSW

												Field ID	MW1	MW2	MW3			
												Location Code	MW1	MW2	MW3			
												Well	-	-	-			
												Sampled Date	7/02/2017	7/02/2017	7/02/2017			
				ANZECC 2000 Fresh Water (95%)	ADWG 2011 Health	ADWG 2011 Aesthetic	NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Clay			NEPM 2013 GW HSL Residential A&B, for Vapour Intrusion, Sand						**Statistical Summary**		
			LOR				**2-4m**	**4-8m**	**>8m**	**2-4m**	**4-8m**	**>8m**				Maximum	Average	Standard
BTEX	Benzene	µg/L	1	**950**	**1**		**5000**	**5000**	**5000**	**800**	**800**	**900**	<1	<1	<1	<1	<1	0
	Toluene	µg/L	1		**800**	**25**	**NL**	**NL**	**NL**	**NL**	**NL**	**NL**	<1	<1	<1	<1	<1	0
	Ethylbenzene	µg/L	1		**300**	**3**	**NL**	**NL**	**NL**	**NL**	**NL**	**NL**	<1	<1	<1	<1	<1	0
	Xylene (m & p)	µg/L	2										<2	<2	<2	<2	<2	0
	Xylene (o)	µg/L	1	**350**									<1	<1	<1	<1	<1	0
	Xylene Total	µg/L	3		**600**	**20**	**NL**	**NL**	**NL**	**NL**	**NL**	**NL**	<3	<3	<3	<3	<3	0
TRH	C6 - C9	µg/L	20										<20	<20	<20	<20	<20	0
	C10 - C14	µg/L	50										<50	<50	<50	<50	<50	0
	C15 - C28	µg/L	100										<100	<100	<100	<100	<100	0
	C29-C36	µg/L	100										<100	<100	<100	<100	<100	0
	+C10 - C36 (Sum of total)	µg/L	100										<100	<100	<100	<100	<100	0
CRC Care TRH Fractions	C6-C10	µg/L	20										<20	<20	<20	<20	<20	0
	C10-C16	µg/L	50										<50	<50	<50	<50	<50	0
	C16-C34	µg/L	100										<100	<100	<100	<100	<100	0
	C34-C40	µg/L	100										<100	<100	<100	<100	<100	0
	F1: C6-C10 less BTEX	µg/L	20				**NL**	**NL**	**NL**	**1000**	**1000**	**1000**	<20	<20	<20	<20	<20	0
	F2: >C10-C16 less Naphthalene	µg/L	50				**NL**	**NL**	**NL**	**1000**	**1000**	**1000**	<50	<50	<50	<50	<50	0
PAH	Benzo(b+j)fluoranthene	µg/L	1										<1	<1	<1	<1	<1	0
	Acenaphthene	µg/L	1										<1	<1	<1	<1	<1	0
	Acenaphthylene	µg/L	1										<1	<1	<1	<1	<1	0
	Anthracene	µg/L	1	**0.4**									**<1**	**<1**	**<1**	<1	<1	0
	Benz(a)anthracene	µg/L	1										<1	<1	<1	<1	<1	0
	Benzo(a) pyrene	µg/L	1		**0.01**								**<1**	**<1**	**<1**	<1	<1	0
	Benzo(g,h,i)perylene	µg/L	1										<1	<1	<1	<1	<1	0
	Benzo(k)fluoranthene	µg/L	1										<1	<1	<1	<1	<1	0
	Chrysene	µg/L	1										<1	<1	<1	<1	<1	0
	Dibenz(a,h)anthracene	µg/L	1										<1	<1	<1	<1	<1	0
	Fluoranthene	µg/L	1										<1	<1	<1	<1	<1	0
	Fluorene	µg/L	1										<1	<1	<1	<1	<1	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1										<1	<1	<1	<1	<1	0
	Naphthalene	µg/L	1	**16**			**NL**	**NL**	**NL**	**NL**	**NL**	**NL**	<1	<1	<1	<1	<1	0
	PAHs (Sum of total)	µg/L	1										<1	<1	<1	<1	<1	0
	Phenanthrene	µg/L	1										<1	<1	<1	<1	<1	0
	Pyrene	µg/L	1										<1	<1	<1	<1	<1	0
Metals	Arsenic (Filtered)	mg/L	0.001		**0.01**								0.001	<0.001	<0.001	0.001	0.001	0
	Cadmium (Filtered)	mg/L	0.0002	**0.0002**	**0.002**								<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0
	Chromium (III+VI) (Filtered)	mg/L	0.001										<0.001	<0.001	<0.001	<0.001	0.001	0
	Copper (Filtered)	mg/L	0.001	**0.0014**	**2**	**1**							**0.003**	**0.006**	**0.004**	0.006	0.0043	0.0015
	Lead (Filtered)	mg/L	0.001	**0.0034**	**0.01**								<0.001	<0.001	<0.001	<0.001	0.001	0
	Mercury (Filtered)	mg/L	0.0001	**0.0006**	**0.001**								<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0
	Nickel (Filtered)	mg/L	0.001	**0.011**	**0.02**								**0.029**	0.003	0.008	0.029	0.013	0.014
	Zinc (Filtered)	mg/L	0.005	**0.008**		**3**							**0.18**	**0.068**	**0.044**	0.18	0.097	0.073
Organochlorine Pesticides	4,4-DDE	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	a-BHC	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Aldrin	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	b-BHC	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	chlordane	µg/L	1	**0.08**	**2**								**<1**	**<1**	**<1**	<1	<1	0
	d-BHC	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	DDD	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	DDT	µg/L	0.1	**0.01**	**9**								**<0.1**	**<0.1**	**<0.1**	<0.1	<0.1	0
	Dieldrin	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Endosulfan I	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Endosulfan II	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Endosulfan sulphate	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Endrin	µg/L	0.1	**0.02**									**<0.1**	**<0.1**	**<0.1**	<0.1	<0.1	0
	Endrin aldehyde	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Endrin ketone	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	g-BHC (Lindane)	µg/L	0.1	**0.2**	**10**								<0.1	<0.1	<0.1	<0.1	<0.1	0
	Heptachlor	µg/L	0.1	**0.09**	**0.3**								**<0.1**	**<0.1**	**<0.1**	<0.1	<0.1	0
	Heptachlor epoxide	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Hexachlorobenzene	µg/L	0.1										<0.1	<0.1	<0.1	<0.1	<0.1	0
	Methoxychlor	µg/L	0.1		**300**								<0.1	<0.1	<0.1	<0.1	<0.1	0
	Toxaphene	mg/L	0.01	**0.0002**									**<0.01**	**<0.01**	**<0.01**	<0.01	<0.01	0
Polychlorinated Biphenyls	Arochlor 1016	µg/L	1										<1	<1	<1	<1	<1	0
	Arochlor 1221	µg/L	1										<1	<1	<1	<1	<1	0
	Arochlor 1232	µg/L	1										<1	<1	<1	<1	<1	0
	Arochlor 1242	µg/L	1	**0.6**									**<1**	**<1**	**<1**	<1	<1	0
	Arochlor 1248	µg/L	1										<1	<1	<1	<1	<1	0
	Arochlor 1254	µg/L	1	**0.03**									**<1**	**<1**	**<1**	<1	<1	0
	Arochlor 1260	µg/L	1										<1	<1	<1	<1	<1	0
	PCBs (Sum of total)	µg/L	1										<1	<1	<1	<1	<1	0

453 – 459 Canterbury Road, Campsie, NSW

APPENDIX D

PHOTOGRAPHIC LOG

Photograph 1. North-western portion of site, rear of automobile workshop, facing east towards former UST area.

Photograph 2. Southern portion of site, car parking area to commercial premises, facing east.

Photograph 3. Northern portion of Site, asbestos cement debris on soil surface.

Photograph 4. Southern portion of Site, adjoining Canterbury Road

Photograph 5. South-eastern portion of Site, corner of Canterbury Road and Stanley Street.

Photograph 6. BH5 near potential waste oil UST in operational workshop

Photograph 7. View along eastern boundary.

Photograph 8. North eastern corner of the site

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APPENDIX

E

QA / QC REPORT

E - Quality Control / Quality Assurance Report

Quality Assurance/Quality Control (QA/QC) procedures were implemented to ensure the precision accuracy, representativeness, completeness and comparability of all data gathered. The QA/QC procedures included:

- Equipment calibration to ensure field measurements obtained are accurate;
- Equipment decontamination to prevent cross contamination;
- The completion of a log for each soil bore;
- Use of appropriate measures (i.e. gloves) to prevent cross contamination;
- Appropriate sample identification;
- Collection and analysis of duplicate samples for QA/QC purposes;
- Correct sample preservation;
- Sample transport with Chain of Custody (COC) documentation; and
- Laboratory analysis in accordance with NATA accredited methods.

Table F 1 details the QA/QC procedures and sample collection details undertaken through the soil elements of the investigation. **Table E2** summarises the number of QA/QC samples collected during this investigation. Copies of all the COCs, along with the Sample Receipt Notifications (SRNs), Interpretive QA/QC Reports are provided in **Appendix J**.

Table E 1 Field QAQC Method Validation

Requirement	Yes/No	Comments
Equipment calibration	Yes	Calibration certificates are presented in **Appendix F**.
Equipment decontamination	Yes	Decontamination of sampling equipment (water quality meter etc.) was undertaken by washing with phosphate free detergent (Decon 90) followed by a rinse with potable water.
Soil logging	Yes	All boreholes drilled and soil samples collected were logged in accordance with the Unified Soil Classification System. Borehole logs are provided in **Appendix B**.
Sample collection	Yes	Samples were collected using disposable nitrile gloves and LDPE tubing and placed directly into Teflon lined sample jars provided by the laboratory. A clean pair of gloves and new bailer was used for each new sample being collected to limit the possibility of cross-contamination.
Sample identification	Yes	All samples were marked with a unique identifier including project number, sample location, depth and date.
QA/QC sample collection	Yes/No	One (1) soil duplicate samples was collected for intra-lab QA/QC purposes with a further one (1) triplicate samples collected to monitor the quality of the field practices for sample collection. Cardno based the investigation around a rate of one duplicate sample per 20 primary samples, as the requirement for duplicate sample collection. No groundwater duplicate samples were collected due to insufficient sample volume.
Sample preservation	Yes	Samples were placed in a chilled ice box with ice for storage and transport to the laboratory.
COC documentation	Yes	A COC form was completed by Cardno detailing sample identification, collection date, sampler and laboratory analysis required. The COC form was signed off and returned to Cardno by the laboratory staff upon receipt of all the samples. COC forms and Sample Receipt Notification (SRN) are provided in **Appendix I**. The SRN indicates that the samples were received at the laboratory intact and chilled and within the required holding times.

Requirement	Yes/No	Comments
NATA accredited methods	Yes	The NATA accredited Eurofins mgt analysed the samples in accordance with NATA accredited methods. Inter-lab QAQC samples were analysed at ALS Environmental. Analytical methods used are indicated in the stamped laboratory results provided in **Appendix I**.
Laboratory Internal QC	Yes	All Data Quality Objectives were met by the laboratories.

Table E 2 Field QAQC Collection Summary

Investigation Element	Date	Sample Type and Number of Samples					
		Primary	Duplicate	Split (Triplicate)	Trip blank	Trip Spike	Rinsate
Soil	18/01/2017	20	1	1	0	0	0

Relative Percentage Difference Determination

Laboratory results for duplicate and triplicate samples are assessed using a determination of the Relative Percentage Difference (RPD). Where a primary sample and a duplicate sample are compared, the RPD provides an indication of the reproducibility of the results, which incorporates the sampling method. Where a primary sample and a split sample are compared, the RPD provides an indication of the accuracy of the primary laboratory results as compared to the secondary laboratory result.

The calculation used to determine the RPD is:

$$RPD = \frac{(Co - Cs)}{\left(\frac{Co + Cs}{2}\right)} x100$$

Where:

Co = Concentration of the original sample

Cs = Concentration of the duplicate sample

In calculating the RPD values the following protocols were adopted:

- Where both concentrations are above laboratory reporting limits the RPD formula is used;
- Where both concentrations are below the laboratory reporting limits, no RPD is calculated; and
- Where one or both sample concentrations are reported to be less than ten times (<10x) the laboratory reporting limit, the RPD is calculated but is not assessed against the adopted criterion.

In accordance with the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended 2013, Cardno adopts an RPD acceptance criterion up to 30% of the mean concentration of the analyte. It should be noted that variations might be higher for organic analysis, due to the volatile nature of the components, and for low concentrations of analytes.

The adopted criterion will not apply to RPDs where one of both concentrations are less than 10 times the reporting limit, as this criterion would otherwise overestimate the significance of minor variations in concentrations at or near the laboratory reporting limit. Large RPDs returned for low concentrations of analytes near the reporting limit is not as indicative of a significant difference in the results as a small RPD is for larger concentrations.

This approach is employed by NATA accredited laboratories when assessing internal duplicate sample RPDs. This approach acknowledges that concentrations at or around the reporting limit are too low for an accurate evaluation of the significance of the RPD.

This approach has been adopted when assessing the relevance (compliance) of RPDs during this investigation. RPDs will be calculated for sample sets where one or both concentrations are less than 10 times the reporting limit for discussion purposes, but will not be assessed as a pass or fail in relation to the criterion.

The parent-duplicate-triplicate sample relationships are presented in **Table E 3**, with RPD results presented in **Appendix C**.

Table E 1 Duplicate and Triplicate Sample Summary

Matrix	Date	Sample Type and Number of Samples		
		Parent Sample	Duplicate	Triplicate (Split)
Soil	18/01/2017	MW3_	QA1	QA2

The RPDs for all analytes were less than the adopted limits, with the exception of TRH C_{15}-C_{28} where the Duplicate RPD (30%) and the triplicate RPD (56%) exceeded the adopted 30% limit. Given the low concentrations of the hydrocarbons relative to the LOR, these results are not considered to alter the validity of the assessment.

Laboratory QC and QCI Report Summary

The laboratory selected for undertaking the analysis (Eurofins mgt) is NATA accredited for the analysis required, and undertook certain QA/QC requirements to demonstrate the suitability of the data that is obtained. The laboratory is required to undertake and report internal laboratory Quality Control (QC) procedures for all chemical analysis undertaken. The QC testing is required to include:

- Laboratory duplicate sample analysis at the rate of one duplicate analysis per ten samples
- Method blank at the rate of one method blank analysis per 20 samples
- Laboratory control sample at the rate of one laboratory control sample analysis per 20 samples
- Spike recovery analysis at the rate of one spike recovery analysis per 20 samples.

Compliance with the laboratory QA/QC requirements and non-conformance details are discussed in the internal Laboratory QA/QC reports included with the certificates of analysis in **Appendix I**.

Data quality outliers were reported by Eurofins mgt for the analysis undertaken. However, the data is considered suitable to screen, delineate and determine the presence or absence of these contaminants at the Site.

Cardno concludes that the data reported by the NATA accredited Eurofins mgt as presented in this report is suitable for interpretative purposes and to make conclusions/recommendations regarding Site contamination.

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APPENDIX F

CALIBRATION CERTIFICATES

Field Calibration Checklist
Equipment Report – MiniRAE Lite PID

This MiniRAE Lite PID (*Unit*) has been performance checked as per Cardno Geosciences & Environment's *Equipment Bump Test and Calibration Procedure – MiniRAE Lite PID*.

The most recent **factory calibration** conducted on the unit expires on 28/12/2016.

The Unit has been checked for and comprises of the following items:

Present	Damaged	Item
☑	☐	Carry case
☑	☐	MiniRAE Lite PID unit
☑	☐	Span gas cylinder containing 100ppm Iso-Butylene
☑	☐	Span gas flow control valve
☑	☐	Tubing to connect span gas to the Unit
☑	☐	Repair kit
☑	☐	Lamp cleaning kit
☑	☐	MiniRAE Lite PID User's Guide
☑	☐	Spare battery cartridge
☑	☐	Spare external filter/s
☑	☐	Computer connector cable
☑	☐	*Multi Gas Detector Bump Test and Field Calibration Procedure*
☑	☐	Recharger & recharging dock
☑	☐	AES Calibration Certificate (factory calibration)

The following tests and operational checks have been conducted on the Unit:

Test Completed	Test Passed	Test
☑	☑	Battery Voltage >4.2V (_____V)
☑	☑	Operations check (screen functions)
☑	☑	Pump test conducted
☑	☑	10 Minute test (Unit is operational)

The Unit has been performance checked and field calibrated as follows:

Sensor	Span Gas Concentrations	Fresh Air Calibration	Span Gas Field Calibration	Bump Test Range Within ±5%
VOCs	100 ppm	☑	☑	☐ (±5 ppm)

Checked/ Field Calibrated by: YS

Signed: Y Shalev

Date: 29.7.16

ThermoFisher SCIENTIFIC

The world leader in serving science

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	7.00H / pH 4.00	7.00 pH	4.00 pH	NI1803/NE1989	☑
Conductivity	12.88 mS/cm	0 mS/cm	12.88 mS/cm	OA1331	☑
TDS	36 ppk	0 ppk	36 ppk	NJ1857	☑
Dissolved Oxygen	Sodium Sulphite / Air	0 ppm in Sodium Sulphite	8.79 ppm Saturation in Air	1602213461 NJ1314	☑

Check only

Redox (ORP) *	Electrode operability test	240mV +/- 10%	232 mV	ND1568(A) ND1857(B)	☑

* This meter uses an Ag/AgCl ORP electrode. To convert readings to SHE (Standard Hydrogen Electrode), add 199mV to the mV reading.

☑ Battery Status 8.1V (min 7.2V)
☑ Electrical Safety Tag attached (AS/NZS 3760)

☑ Temperature 2 Point 22.5 °C
☑ Electrodes Cleaned and checked

Tag No: 00790

Valid to: 14/10/16

Date: 09/09/16

Signed: [signature]

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: 8.1V
☑	☐	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
☑	☐	Power supply 240V to 12V DC 200mA
☑	☐	Instruction Manual
☑	☐	Quick Guide
☑	☐	Plastic container with storage solution for pH and ORP sensors
☑	☐	Carry Case
☑	☐	Check to confirm electrical safety (tag must be valid)

Date: 07/09/2016

Signed: [signature]

TFS Reference	CJ005436	Return Date:	/ /
Customer Reference		Return Time:	
Equipment ID	90FLMVSV	Condition on return:	
Equipment Serial No.	V2038		

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APPENDIX G

SUMMARY OF PREVIOUS REPORTS

G. Site Identification and Previous Reports

This section summarises the findings of previous investigations at the Site.

G.1 Former Investigations

Two previous investigation reports were provided. The findings of each investigation including the relevant environmental information regarding the contamination status of the site from the available reports has been summarised below:

SMEC Testing Services (2014), 'Preliminary Geotechnical Assessment, 453-459 Canterbury Road, Campsie, Project No. 20009/4984C. Dated November

SMEC Testing Services Pty Ltd (SMEC) were commissioned by Lone Star Construction Pty Ltd (SPBC) to undertake a preliminary geotechnical assessment of 453-459 Canterbury Road, Campsie NSW.

The purpose of the investigation was to; assess potential subsurface conditions at the site, classify the site in accordance with AS2870; make comment on temporary and permanent support of the proposed excavation, recommend foundation design parameters and assess potential issues regarding rock excavation.

Site Description

It was understood that the site located at 453-459 Canterbury Road, Campsie and was to be redeveloped two comprise several above ground storeys with one level of basement car parking requiring excavating to a depth of approximately 3 metres below ground level.

Prior to the land swap the site comprised a warehouse, concrete slab and driveway and pavement and asphalt paved parking and storage areas. The site was relatively level. Evidence of a disused underground storage tank (UST) was observed along the northern boundary of the site.

Work Completed

SMEC undertook a site walkover and desktop investigation of the site. Intrusive investigations were not undertaken as part of the assessment.

Results and Conclusions:

> Construction of the basement may require excavation near to the site boundaries, and therefore in close proximity to adjacent buildings.

> There is the potential for medium or high strength rock to be encountered which may necessitate the use of rock excavation equipment.

> Car should be taken so to not damage buildings or other developments on adjacent properties when excavating rock. This may require the adoption of excavation methods which limit ground vibrations.

> Due to the proximity of the excavation to property boundaries, temporary support will be required for soils.

> The base of the proposed excavation is likely to be very stiff silty clays or weathered shale. In order to ensure compliance with bearing values, care should be taken to ensure the base of the excavations is free of loose material prior to concerting.

TRACE Environmental Pty Ltd, Preliminary Site Investigation report, prepared for Lone Star Construction Pty Ltd, Project No: 19687/4272C, Report No: 14/1990 Dated 21 November 2014

TRACE Environmental Pty Ltd (TRACE) were commissioned by Lone Star Construction Pty Ltd to prepare a Preliminary Site Investigation (PSI) for 453-459 Canterbury Road, Campsie NSW.

The objectives of the PSI were to:

> Assess the site condition relative to present and historical contaminating activities;

> Identify any current or historical potentially contaminating activities;

> Identify the potential types and nature of contamination (if applicable);

> Identify potential human and ecological receptors (if applicable);

> Develop a preliminary Conceptual Site Model (CSM) to identify potential risks to human health and /or ecological receptors that could potentially affect the use of the site; and

> Provide conclusions and recommendations regarding the suitability of the site for the proposed redevelopment, and to identify any further investigation for potential site contamination, (if warranted).

Work Completed:

> A desktop study including review of historical records and database searches;

> Undertook a site inspection;

> Developed an initial CSM of the site;

> Outlined any recommendations for further investigation which may be warranted.

Results and Conclusions:

> The site has been used for commercial purposes since the 1960's which included automobile service and maintenance. Prior to this the site was used for low density residential purposes.

> At least two underground storage tanks were historically operating at the site, with them potentially remaining on site. The presence and historic use of USTs may be a source of subsurface impacts.

> Historic car maintenance and servicing activities, importation of uncontrolled fill and the presence of asbestos containing building materials may also be sources of potential soil impacts.

> The environmental site setting was considered to be moderately sensitive based on the preliminary CSM.

> The site is not located in an area of known acid sulfate soils.

TRACE Recommended:

> There is considered to be a moderate potential for subsurface impacts at the Site, and as such a Detailed Site Investigation (DSI) was recommended.

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APPENDIX H

FIELD NOTES

Cardno
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Groundwater Sampling Field Record

WELL ID: MW1

Job Information	
Date: 7/2/17	Project Location: Campsie
Project Name:	Sampler: SJ
Project Number: 59917088	Well Location / Coordinates: Rear Lot

Well Details		
Well Condition: Locked / Unlocked	Well Protection: Cap / Cover	Well Measurement Point: TOC
Casing Diameter: 50mm	Bore Diameter: ~~50mm~~	Screen Depth:
Well Depth (mBGL): 6.021	SWL (mBGL): 1.393	Height of Water Column (m): 4.628
Bore Volume (L): ~~8~~ 9	Purge Volume (L):	LNAPL Thickness (mm):

Sampling Equipment	
Water Quality Probe:	
Interface Probe:	Sling & IP
Purge Method: (Please Circle)	**Bailer:** Stainless Plastic **Pump:** Submersible Micro-purge **Passive:** Hydrasleeve

Purge Water Quality Parameters

Litres	Time	DO (mg/L)	EC (µS/Cm)	pH	Eh (mV)	Temp (°C)	Turb.	Water Colour	Comments / Observations
2	0928		3.31ms	4.55		21.1		brown clear	
4.2	0935		3.64	7.29	171.9	20.5			
6	0939		4.02	7.33	141.16	20.3			
7.8	1056		3.57	7.62	151.8	22.5			
Stabilisation Criteria		±10%	±3%	±0.1	±10 mV	±10%	±10%	-	

Did field parameters stabilise? Y | N | N/A

Was the well dry purged? Y | N

Sample Collection			
	Sample ID:	Duplicate Sample ID:	Rinsate ID:
Container Type			
Field Filtration			
Preservation			

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APPENDIX

I

LABORATORY REPORTS

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Contact Person:	Steven Drysdale	Project Name:	Campsie Dsi
Telephone Number:	94967748	Project Number:	59917080
Alternative Contact:	Hugh Selby	PO No.:	
Telephone Number:	94967700	Project Specific Quote No. :	
Sampler:	Steven Drysdale	Date results required:	Standard
Email Address (results and invoice):	steven.drysdale@cardno.com.au	Report format:	
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065			

Sample Information						Analysis Required											Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	TPH / BTEXN / PAH	Phenol / PCB / OCP	Heavy Metals (8)	Asbestos	Hold							
BH7_0.2		2	Nil	18.01.17	Soil	X	X	X	X								
MW1_1.0		2	Nil	18.01.17	Soil	X	X	X	X								
MW1_0.4		2	Nil	18.01.17	Soil	X	X	X	X								
MW3_0.8		2	Nil	18.01.17	Soil	X	X	X	X								
MW3_3.0		2	Nil	18.01.17	Soil					X							
BH5_0.2		2	Nil	18.01.17	Soil	X	X	X	X								
BH1_1.0-1.5		2	Nil	18.01.17	Soil	X	X	X	X								
BH1_2.4		2	Nil	18.01.17	Soil	X	X	X	X								
BH2_0.5		2	Nil	18.01.17	Soil	X	X	X	X								
BH2_2.4		2	Nil	18.01.17	Soil	X	X	X	X								
BH4_1.5		2	Nil	18.01.17	Soil	X	X	X	X								
BH4_2.5		2	Nil	18.01.17	Soil	X	X	X	X								
BH3_1.8		2	Nil	18.01.17	Soil	X	X	X	X								
BH3_3.0		2	Nil	18.01.17	Soil	X	X	X	X								
BH10_1.6		2	Nil	17.01.17	Soil	X	X	X	X								
BH10_2.0		2	Nil	17.01.17	Soil					X							
BH9_1.0		2	Nil	17.01.17	Soil	X	X	X	X								
BH9_1.3		2	Nil	17.01.17	Soil					X							
BH8_1.6		2	Nil	17.01.17	Soil					X							
BH8_0.5		2	Nil	17.01.17	Soil	X	X	X	X								
BH6_1.2		2	Nil	17.01.17	Soil	X	X	X	X								
BH6_1.8		2	Nil	17.01.17	Soil	X	X	X	X								
MW2_1.0		2	Nil	17.01.17	Soil	X	X	X	X								
MW2_4.9		2	Nil	17.01.17	Soil	X	X	X	X								
QA1		1	Nil	18.01.17	Soil	X	X	X	X								
QA2		1	Nil	18.01.17	Soil												Forward to ALS

Relinquished by:	Received by:	Relinquished by:	Received by: lupan 19/01 4:46pm	Relinquished by:
(name / company)	(name / company)	(name / company)	(name / company)	(name / company)
Date & Time:	Date & Time:	Date & Time:	Date & Time:	Date & Time:
Signature:	Signature:	Signature:	Signature:	Signature:
Received by:	Relinquished by:	Received by:	Relinquished by:	Lab use:

eurofins | mgt

Certificate of Analysis

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Steven Drysdale**

Report **530963-S**
Project name CAMPSIE DSI
Project ID 59917080
Received Date Jan 19, 2017

Client Sample ID			**BH7_0.2**	**MW1_0.8**	**MW1_4.0**	**MW3_0.8**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09848**	**S17-Ja09849**	**S17-Ja09850**	**S17-Ja09851**
Date Sampled			**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**
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	100	1000	220	89
TRH C29-C36	50	mg/kg	< 50	960	190	< 50
TRH C10-36 (Total)	50	mg/kg	100	1960	430	89
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	%	81	84	85	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.2	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.5	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	0.7	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	0.7	< 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	0.7	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	0.7	< 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	1.2	< 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

Client Sample ID			BH7_0.2	MW1_0.8	MW1_4.0	MW3_0.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09848	S17-Ja09849	S17-Ja09850	S17-Ja09851
Date Sampled			Jan 18, 2017	Jan 18, 2017	Jan 18, 2017	Jan 18, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	1.4	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	6.8	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	85	102	96	108
p-Terphenyl-d14 (surr.)	1	%	97	93	88	92
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	< 0.05	< 0.05	< 0.05	< 0.05
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	%	62	58	51	51
Tetrachloro-m-xylene (surr.)	1	%	77	80	60	62
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
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	%	62	58	51	51
Tetrachloro-m-xylene (surr.)	1	%	77	80	60	62
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	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4

Client Sample ID			BH7_0.2	MW1_0.8	MW1_4.0	MW3_0.8
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09848**	**S17-Ja09849**	**S17-Ja09850**	**S17-Ja09851**
Date Sampled			**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**
Test/Reference	LOR	Unit				
Speciated Phenols						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	96	98	95	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	110	1700	350	< 100
TRH >C34-C40	100	mg/kg	< 100	600	110	< 100
Heavy Metals						
Arsenic	2	mg/kg	8.2	11	13	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	23	17	11	6.9
Copper	5	mg/kg	11	33	33	22
Lead	5	mg/kg	160	110	25	71
Mercury	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	6.4	< 5	16
Zinc	5	mg/kg	130	150	20	55
% Moisture	1	%	20	21	17	26

Client Sample ID			BH5_0.2	BH1_1.0-1.5	BH1_2.4	BH2_0.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09852**	**S17-Ja09853**	**S17-Ja09854**	**S17-Ja09855**
Date Sampled			**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**
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	310	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	170	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	500	< 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	%	83	82	83	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20

Client Sample ID			BH5_0.2	BH1_1.0-1.5	BH1_2.4	BH2_0.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09852**	**S17-Ja09853**	**S17-Ja09854**	**S17-Ja09855**
Date Sampled			**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**
Test/Reference	LOR	Unit				
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	%	98	93	94	89
p-Terphenyl-d14 (surr.)	1	%	86	101	104	100
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	< 0.05	< 0.05	< 0.05	< 0.05
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	%	50	61	61	58
Tetrachloro-m-xylene (surr.)	1	%	77	88	83	82

Client Sample ID			BH5_0.2	BH1_1.0-1.5	BH1_2.4	BH2_0.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09852**	**S17-Ja09853**	**S17-Ja09854**	**S17-Ja09855**
Date Sampled			**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
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	%	50	61	61	58
Tetrachloro-m-xylene (surr.)	1	%	77	88	83	82
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	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	92	101	103	99
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	410	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	6.4	19	8.9	350
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.7	16	9.5	8.9
Copper	5	mg/kg	37	88	11	45
Lead	5	mg/kg	24	32	15	63
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.7
Nickel	5	mg/kg	12	6.6	< 5	8.6
Zinc	5	mg/kg	70	72	< 5	240
% Moisture	1	%	8.1	23	19	14

Client Sample ID			BH2_2.4	BH4_1.5	BH4_2.5	BH3_1.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09856	S17-Ja09857	S17-Ja09858	S17-Ja09859
Date Sampled			Jan 18, 2017	Jan 18, 2017	Jan 18, 2017	Jan 18, 2017
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	29	190	< 20
TRH C15-C28	50	mg/kg	< 50	1600	7900	1100
TRH C29-C36	50	mg/kg	< 50	1500	7200	1100
TRH C10-36 (Total)	50	mg/kg	< 50	3129	15290	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	%	83	84	83	83
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	240	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	31	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	31	< 20
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	0.7	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 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	1.7	0.8
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	1.4	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	1.2	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	5.7	0.8
2-Fluorobiphenyl (surr.)	1	%	90	105	96	95
p-Terphenyl-d14 (surr.)	1	%	104	95	107	86
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	< 0.05	< 0.05	< 0.05	< 0.05
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

Client Sample ID			BH2_2.4	BH4_1.5	BH4_2.5	BH3_1.8
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09856**	**S17-Ja09857**	**S17-Ja09858**	**S17-Ja09859**
Date Sampled			**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**	**Jan 18, 2017**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
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	%	62	55	79	53
Tetrachloro-m-xylene (surr.)	1	%	86	78	88	56
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
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	%	62	55	79	53
Tetrachloro-m-xylene (surr.)	1	%	86	78	88	56
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	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	1.8	< 0.5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	99	101	106	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	240	< 50
TRH >C16-C34	100	mg/kg	< 100	2600	13000	1900
TRH >C34-C40	100	mg/kg	< 100	900	4700	680
Heavy Metals						
Arsenic	2	mg/kg	13	32	6.2	9.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	46	24	21	30
Copper	5	mg/kg	7.0	33	21	9.2

Client Sample ID			BH2_2.4	BH4_1.5	BH4_2.5	BH3_1.8
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09856	S17-Ja09857	S17-Ja09858	S17-Ja09859
Date Sampled			Jan 18, 2017	Jan 18, 2017	Jan 18, 2017	Jan 18, 2017
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	27	220	170	31
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	6.1	5.6
Zinc	5	mg/kg	6.7	120	270	6.4
% Moisture	1	%	17	22	34	33

Client Sample ID			BH3_3.0	BH10_1.8	BH9_1.0	BH8_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09860	S17-Ja09861	S17-Ja09862	S17-Ja09863
Date Sampled			Jan 18, 2017	Jan 17, 2017	Jan 17, 2017	Jan 17, 2017
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	70	< 50	56	200
TRH C29-C36	50	mg/kg	50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	120	< 50	56	200
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	%	82	83	82	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	6.8
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	6.8
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	6.8
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.2
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.1
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	4.9
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	4.3
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	4.9
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	3.0
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	3.7
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	4.1
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.8
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	12
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	2.7

Client Sample ID			BH3_3.0	BH10_1.8	BH9_1.0	BH8_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09860	S17-Ja09861	S17-Ja09862	S17-Ja09863
Date Sampled			Jan 18, 2017	Jan 17, 2017	Jan 17, 2017	Jan 17, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	8.1
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	10
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	61.8
2-Fluorobiphenyl (surr.)	1	%	87	89	89	104
p-Terphenyl-d14 (surr.)	1	%	94	97	100	96
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	< 0.05	< 0.05	< 0.05	< 0.05
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	%	69	54	52	73
Tetrachloro-m-xylene (surr.)	1	%	71	93	93	68
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
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	%	69	54	52	73
Tetrachloro-m-xylene (surr.)	1	%	71	93	93	68
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	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4

Client Sample ID			BH3_3.0	BH10_1.8	BH9_1.0	BH8_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09860	S17-Ja09861	S17-Ja09862	S17-Ja09863
Date Sampled			Jan 18, 2017	Jan 17, 2017	Jan 17, 2017	Jan 17, 2017
Test/Reference	LOR	Unit				
Speciated Phenols						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	93	95	95	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	190
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	15	< 2	11	6.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	53	5.9	26	16
Copper	5	mg/kg	6.2	6.2	5.4	13
Lead	5	mg/kg	29	15	25	180
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	9.3	< 5	5.8	76
% Moisture	1	%	29	20	24	18

Client Sample ID			BH6_1.2	BH6_1.8	MW2_1.0	MW2_4.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-Ja09864	S17-Ja09865	S17-Ja09866	S17-Ja09867
Date Sampled			Jan 17, 2017	Jan 17, 2017	Jan 17, 2017	Jan 17, 2017
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	96	< 50	77	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	96	< 50	77	< 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	%	83	84	84	84
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20

Client Sample ID			BH6_1.2	BH6_1.8	MW2_1.0	MW2_4.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09864**	**S17-Ja09865**	**S17-Ja09866**	**S17-Ja09867**
Date Sampled			**Jan 17, 2017**	**Jan 17, 2017**	**Jan 17, 2017**	**Jan 17, 2017**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	3.5	< 0.5	0.8	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	3.7	0.6	1.1	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	4.0	1.2	1.4	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	2.4	< 0.5	0.8	< 0.5
Benzo(a)pyrene	0.5	mg/kg	2.5	< 0.5	0.6	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	3.1	< 0.5	0.8	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	2.6	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	2.1	< 0.5	0.5	< 0.5
Chrysene	0.5	mg/kg	2.1	< 0.5	0.7	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	4.0	< 0.5	1.1	< 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	1.8	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	1.2	< 0.5	0.8	< 0.5
Pyrene	0.5	mg/kg	4.1	< 0.5	1.1	< 0.5
Total PAH*	0.5	mg/kg	25.9	< 0.5	6.4	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	89	99	87
p-Terphenyl-d14 (surr.)	1	%	94	101	95	98
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	< 0.05	< 0.05	< 0.05	< 0.05
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	%	77	70	66	58
Tetrachloro-m-xylene (surr.)	1	%	94	86	76	83

Client Sample ID			BH6_1.2	BH6_1.8	MW2_1.0	MW2_4.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-Ja09864**	**S17-Ja09865**	**S17-Ja09866**	**S17-Ja09867**
Date Sampled			**Jan 17, 2017**	**Jan 17, 2017**	**Jan 17, 2017**	**Jan 17, 2017**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
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	%	77	70	66	58
Tetrachloro-m-xylene (surr.)	1	%	94	86	76	83
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	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
4-Chloro-3-methylphenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1.0	mg/kg	< 1	< 1	< 1	< 1
Phenol-d5 (surr.)	1	%	93	94	96	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	14	9.6	5.3	11
Cadmium	0.4	mg/kg	0.7	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	33	26	13	7.4
Copper	5	mg/kg	26	< 5	48	19
Lead	5	mg/kg	240	20	300	430
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.9	0.1
Nickel	5	mg/kg	9.1	< 5	5.1	5.2
Zinc	5	mg/kg	500	< 5	500	350
% Moisture	1	%	23	24	17	17

Client Sample ID			QA1
Sample Matrix			Soil
Eurofins | mgt Sample No.			S17-Ja09868
Date Sampled			Jan 17, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	66
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	66
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	97
p-Terphenyl-d14 (surr.)	1	%	91
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
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05

Client Sample ID			QA1
Sample Matrix			Soil
Eurofins | mgt Sample No.			S17-Ja09868
Date Sampled			Jan 17, 2017
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
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	%	54
Tetrachloro-m-xylene (surr.)	1	%	72
Polychlorinated Biphenyls			
Aroclor-1016	0.5	mg/kg	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1
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	%	54
Tetrachloro-m-xylene (surr.)	1	%	72
Speciated Phenols			
2.4-Dichlorophenol	0.5	mg/kg	< 0.5
2.4-Dimethylphenol	0.5	mg/kg	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1
2.4.6-Trichlorophenol	1.0	mg/kg	< 1
Phenol	0.5	mg/kg	< 0.5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4
2-Chlorophenol	0.5	mg/kg	< 0.5
2-Nitrophenol	1	mg/kg	< 1
4-Chloro-3-methylphenol	1.0	mg/kg	< 1
Pentachlorophenol	1.0	mg/kg	< 1
Phenol-d5 (surr.)	1	%	91
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Heavy Metals			
Arsenic	2	mg/kg	10
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	7.6
Copper	5	mg/kg	28

Client Sample ID			QA1
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S17-Ja09868**
Date Sampled			**Jan 17, 2017**
Test/Reference	LOR	Unit	
Heavy Metals			
Lead	5	mg/kg	87
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	15
Zinc	5	mg/kg	68
% Moisture	1	%	8.6

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 20, 2017	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 20, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 20, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Sydney	Jan 20, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 20, 2017	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Organochlorine Pesticides	Sydney	Jan 20, 2017	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls	Sydney	Jan 20, 2017	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Speciated Phenols	Sydney	Jan 20, 2017	14 Day
- Method: E008 Speciated Phenols			
Metals M8	Sydney	Jan 20, 2017	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
% Moisture	Sydney	Jan 19, 2017	14 Day
- Method: LTM-GEN-7080 Moisture			

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Site # 18217

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: CAMPSIE DSI
Project ID: 59917080

Order No.:
Report #: 530963
Phone: 02 9496 7822
Fax: 02 9499 3902

Received: Jan 19, 2017 1:46 PM
Due: Jan 27, 2017
Priority: 5 Day
Contact Name: Steven Drysdale

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Speciated Phenols	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 18217															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BH7_0.2	Jan 18, 2017		Soil	S17-Ja09848	X		X	X	X	X	X	X	X	X
2	MW1_0.8	Jan 18, 2017		Soil	S17-Ja09849	X		X	X	X	X	X	X	X	X
3	MW1_4.0	Jan 18, 2017		Soil	S17-Ja09850	X		X	X	X	X	X	X	X	X
4	MW3_0.8	Jan 18, 2017		Soil	S17-Ja09851	X		X	X	X	X	X	X	X	X
5	BH5_0.2	Jan 18, 2017		Soil	S17-Ja09852	X		X	X	X	X	X	X	X	X
6	BH1_1.0-1.5	Jan 18, 2017		Soil	S17-Ja09853	X		X	X	X	X	X	X	X	X
7	BH1_2.4	Jan 18, 2017		Soil	S17-Ja09854	X		X	X	X	X	X	X	X	X
8	BH2_0.5	Jan 18, 2017		Soil	S17-Ja09855	X		X	X	X	X	X	X	X	X
9	BH2_2.4	Jan 18, 2017		Soil	S17-Ja09856	X		X	X	X	X	X	X	X	X

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Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Speciated Phenols	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 18217															
10	BH4_1.5	Jan 18, 2017		Soil	S17-Ja09857	X		X	X	X	X	X	X	X	X
11	BH4_2.5	Jan 18, 2017		Soil	S17-Ja09858	X		X	X	X	X	X	X	X	X
12	BH3_1.8	Jan 18, 2017		Soil	S17-Ja09859	X		X	X	X	X	X	X	X	X
13	BH3_3.0	Jan 18, 2017		Soil	S17-Ja09860	X		X	X	X	X	X	X	X	X
14	BH10_1.8	Jan 17, 2017		Soil	S17-Ja09861	X		X	X	X	X	X	X	X	X
15	BH9_1.0	Jan 17, 2017		Soil	S17-Ja09862	X		X	X	X	X	X	X	X	X
16	BH8_0.5	Jan 17, 2017		Soil	S17-Ja09863	X		X	X	X	X	X	X	X	X
17	BH6_1.2	Jan 17, 2017		Soil	S17-Ja09864	X		X	X	X	X	X	X	X	X
18	BH6_1.8	Jan 17, 2017		Soil	S17-Ja09865	X		X	X	X	X	X	X	X	X
19	MW2_1.0	Jan 17, 2017		Soil	S17-Ja09866	X		X	X	X	X	X	X	X	X
20	MW2_4.5	Jan 17, 2017		Soil	S17-Ja09867	X		X	X	X	X	X	X	X	X
21	QA1	Jan 17, 2017		Soil	S17-Ja09868	X		X	X	X	X	X	X	X	X

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Received: Jan 19, 2017 1:46 PM
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Priority: 5 Day
Contact Name: Steven Drysdale

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Speciated Phenols	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 18217															
22	MW3_3.0	Jan 18, 2017		Soil	S17-Ja09869		X								
23	BH10_2.0	Jan 17, 2017		Soil	S17-Ja09870		X								
24	BH9_1.3	Jan 17, 2017		Soil	S17-Ja09871		X								
25	BH8_1.6	Jan 17, 2017		Soil	S17-Ja09872		X								
Test Counts						21	4	21	21	21	21	21	21	21	21

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
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 & PFASs 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, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene 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 Aroclor 1260 in Matrix Spikes and LCS.
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 RPDs 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	
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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	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	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1.0	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1.0	Pass	
Pentachlorophenol	mg/kg	< 1			1.0	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
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	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	109			70-130	Pass	
TRH C10-C14	%	76			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	104			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	98			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	%	98			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	87			70-130	Pass	
TRH C6-C10	%	106			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	86			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	85			70-130	Pass	
Benz(a)anthracene	%	84			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	%	91			70-130	Pass	
Benzo(g.h.i)perylene	%	85			70-130	Pass	
Benzo(k)fluoranthene	%	92			70-130	Pass	
Chrysene	%	94			70-130	Pass	
Dibenz(a.h)anthracene	%	81			70-130	Pass	
Fluoranthene	%	86			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	77			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	77			70-130	Pass	
Pyrene	%	85			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	85			70-130	Pass	
4.4'-DDD	%	84			70-130	Pass	
4.4'-DDE	%	83			70-130	Pass	
4.4'-DDT	%	96			70-130	Pass	
a-BHC	%	81			70-130	Pass	
Aldrin	%	82			70-130	Pass	
b-BHC	%	80			70-130	Pass	
d-BHC	%	90			70-130	Pass	
Dieldrin	%	84			70-130	Pass	
Endosulfan I	%	84			70-130	Pass	
Endosulfan II	%	81			70-130	Pass	
Endosulfan sulphate	%	87			70-130	Pass	
Endrin	%	90			70-130	Pass	
Endrin aldehyde	%	82			70-130	Pass	
Endrin ketone	%	81			70-130	Pass	
g-BHC (Lindane)	%	76			70-130	Pass	
Heptachlor	%	101			70-130	Pass	
Heptachlor epoxide	%	85			70-130	Pass	
Hexachlorobenzene	%	79			70-130	Pass	
Methoxychlor	%	89			70-130	Pass	
Toxaphene	%	75			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	101			70-130	Pass	
LCS - % Recovery							
Speciated Phenols							
2.4-Dichlorophenol	%	90			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dimethylphenol	%	82			30-130	Pass	
2.4.5-Trichlorophenol	%	110			30-130	Pass	
2.4.6-Trichlorophenol	%	89			30-130	Pass	
Phenol	%	99			30-130	Pass	
2-Methylphenol (o-Cresol)	%	92			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	91			30-130	Pass	
2-Chlorophenol	%	100			30-130	Pass	
2-Nitrophenol	%	76			30-130	Pass	
4-Chloro-3-methylphenol	%	114			30-130	Pass	
Pentachlorophenol	%	62			30-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	71			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			70-130	Pass	
Cadmium	%	92			70-130	Pass	
Chromium	%	94			70-130	Pass	
Copper	%	93			70-130	Pass	
Lead	%	98			70-130	Pass	
Mercury	%	98			70-130	Pass	
Nickel	%	92			70-130	Pass	
Zinc	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	S17-Ja08683	NCP	%	92			70-130	Pass	
b-BHC	S17-Ja08693	NCP	%	70			70-130	Pass	
Endosulfan sulphate	S17-Ja08693	NCP	%	77			70-130	Pass	
Endrin ketone	S17-Ja08693	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S17-Ja14778	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-Ja09849	CP	%	119			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-Ja09849	CP	%	98			70-130	Pass	
Toluene	S17-Ja09849	CP	%	92			70-130	Pass	
Ethylbenzene	S17-Ja09849	CP	%	93			70-130	Pass	
m&p-Xylenes	S17-Ja09849	CP	%	93			70-130	Pass	
o-Xylene	S17-Ja09849	CP	%	93			70-130	Pass	
Xylenes - Total	S17-Ja09849	CP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-Ja09849	CP	%	80			70-130	Pass	
TRH C6-C10	S17-Ja09849	CP	%	121			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-Ja09849	CP	%	92			70-130	Pass	
Acenaphthylene	S17-Ja09849	CP	%	87			70-130	Pass	
Anthracene	S17-Ja09849	CP	%	101			70-130	Pass	
Benzo(a)pyrene	S17-Ja09849	CP	%	90			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	S17-Ja09849	CP	%	129			70-130	Pass	
Benzo(k)fluoranthene	S17-Ja09849	CP	%	87			70-130	Pass	
Chrysene	S17-Ja09849	CP	%	98			70-130	Pass	
Dibenz(a.h)anthracene	S17-Ja09849	CP	%	111			70-130	Pass	
Fluorene	S17-Ja09849	CP	%	91			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-Ja09849	CP	%	123			70-130	Pass	
Naphthalene	S17-Ja09849	CP	%	96			70-130	Pass	
Phenanthrene	S17-Ja09849	CP	%	77			70-130	Pass	
Pyrene	S17-Ja09849	CP	%	70			70-130	Pass	
Spike - % Recovery									
Speciated Phenols				Result 1					
2.4-Dichlorophenol	S17-Ja09849	CP	%	96			30-130	Pass	
2.4-Dimethylphenol	S17-Ja09849	CP	%	91			30-130	Pass	
2.4.5-Trichlorophenol	S17-Ja09849	CP	%	91			30-130	Pass	
2.4.6-Trichlorophenol	S17-Ja09849	CP	%	87			30-130	Pass	
Phenol	S17-Ja09849	CP	%	96			30-130	Pass	
2-Methylphenol (o-Cresol)	S17-Ja09849	CP	%	95			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S17-Ja09849	CP	%	92			30-130	Pass	
2-Chlorophenol	S17-Ja09849	CP	%	96			30-130	Pass	
2-Nitrophenol	S17-Ja09849	CP	%	73			30-130	Pass	
4-Chloro-3-methylphenol	S17-Ja09849	CP	%	95			30-130	Pass	
Pentachlorophenol	S17-Ja09849	CP	%	41			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S17-Ja09852	CP	%	99			70-130	Pass	
Cadmium	S17-Ja09852	CP	%	93			70-130	Pass	
Chromium	S17-Ja09852	CP	%	98			70-130	Pass	
Copper	S17-Ja09852	CP	%	117			70-130	Pass	
Lead	S17-Ja09852	CP	%	103			70-130	Pass	
Mercury	S17-Ja09852	CP	%	96			70-130	Pass	
Nickel	S17-Ja09852	CP	%	94			70-130	Pass	
Zinc	S17-Ja09852	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S17-Ja09853	CP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S17-Ja09853	CP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-Ja09859	CP	%	99			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-Ja09859	CP	%	91			70-130	Pass	
Toluene	S17-Ja09859	CP	%	85			70-130	Pass	
Ethylbenzene	S17-Ja09859	CP	%	85			70-130	Pass	
m&p-Xylenes	S17-Ja09859	CP	%	85			70-130	Pass	
o-Xylene	S17-Ja09859	CP	%	85			70-130	Pass	
Xylenes - Total	S17-Ja09859	CP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-Ja09859	CP	%	95			70-130	Pass	
TRH C6-C10	S17-Ja09859	CP	%	100			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-Ja09859	CP	%	88			70-130	Pass	
Acenaphthylene	S17-Ja09859	CP	%	83			70-130	Pass	
Anthracene	S17-Ja09859	CP	%	88			70-130	Pass	
Benz(a)anthracene	S17-Ja09859	CP	%	73			70-130	Pass	
Benzo(a)pyrene	S17-Ja09859	CP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	S17-Ja09859	CP	%	82			70-130	Pass	
Benzo(g.h.i)perylene	S17-Ja09859	CP	%	122			70-130	Pass	
Benzo(k)fluoranthene	S17-Ja09859	CP	%	111			70-130	Pass	
Chrysene	S17-Ja09859	CP	%	105			70-130	Pass	
Dibenz(a.h)anthracene	S17-Ja09859	CP	%	105			70-130	Pass	
Fluoranthene	S17-Ja09859	CP	%	83			70-130	Pass	
Fluorene	S17-Ja09859	CP	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-Ja09859	CP	%	107			70-130	Pass	
Naphthalene	S17-Ja09859	CP	%	75			70-130	Pass	
Phenanthrene	S17-Ja09859	CP	%	81			70-130	Pass	
Pyrene	S17-Ja09859	CP	%	83			70-130	Pass	
Spike - % Recovery									
Speciated Phenols				Result 1					
2.4-Dichlorophenol	S17-Ja09859	CP	%	97			30-130	Pass	
2.4-Dimethylphenol	S17-Ja09859	CP	%	88			30-130	Pass	
2.4.5-Trichlorophenol	S17-Ja09859	CP	%	77			30-130	Pass	
2.4.6-Trichlorophenol	S17-Ja09859	CP	%	90			30-130	Pass	
Phenol	S17-Ja09859	CP	%	93			30-130	Pass	
2-Methylphenol (o-Cresol)	S17-Ja09859	CP	%	94			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S17-Ja09859	CP	%	93			30-130	Pass	
2-Chlorophenol	S17-Ja09859	CP	%	94			30-130	Pass	
2-Nitrophenol	S17-Ja09859	CP	%	77			30-130	Pass	
4-Chloro-3-methylphenol	S17-Ja09859	CP	%	91			30-130	Pass	
Pentachlorophenol	S17-Ja09859	CP	%	87			30-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S17-Ja09860	CP	%	74			70-130	Pass	
4.4'-DDD	S17-Ja09860	CP	%	80			70-130	Pass	
4.4'-DDE	S17-Ja09860	CP	%	74			70-130	Pass	
a-BHC	S17-Ja09860	CP	%	77			70-130	Pass	
Aldrin	S17-Ja09860	CP	%	75			70-130	Pass	
d-BHC	S17-Ja09860	CP	%	83			70-130	Pass	
Dieldrin	S17-Ja09860	CP	%	74			70-130	Pass	
Endosulfan I	S17-Ja09860	CP	%	74			70-130	Pass	
Endosulfan II	S17-Ja09860	CP	%	70			70-130	Pass	
Endrin	S17-Ja09860	CP	%	70			70-130	Pass	
Endrin aldehyde	S17-Ja09860	CP	%	71			70-130	Pass	
g-BHC (Lindane)	S17-Ja09860	CP	%	70			70-130	Pass	
Heptachlor	S17-Ja09860	CP	%	75			70-130	Pass	
Heptachlor epoxide	S17-Ja09860	CP	%	72			70-130	Pass	
Hexachlorobenzene	S17-Ja09860	CP	%	91			70-130	Pass	
Methoxychlor	S17-Ja09860	CP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S17-Ja09863	CP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S17-Ja09863	CP	%	86			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	S17-Ja09848	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-Ja09848	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-Ja09848	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S17-Ja09848	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S17-Ja09848	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S17-Ja09848	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S17-Ja09848	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S17-Ja09848	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	Q15
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S17-Ja09848	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-Ja09848	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Methoxychlor	S17-Ja09848	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-Ja09848	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S17-Ja09848	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2.4-Dichlorophenol	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dimethylphenol	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S17-Ja09848	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S17-Ja09848	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Phenol	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S17-Ja09848	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S17-Ja09848	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
2-Chlorophenol	S17-Ja09848	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Nitrophenol	S17-Ja09848	CP	mg/kg	< 1	< 1	<1	30%	Pass	
4-Chloro-3-methylphenol	S17-Ja09848	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S17-Ja09848	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S17-Ja09849	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-Ja09849	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S17-Ja09849	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-Ja09849	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S17-Ja09849	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S17-Ja09849	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S17-Ja09849	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S17-Ja09849	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S17-Ja09849	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1254	S17-Ja09849	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S17-Ja09849	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S17-Ja09851	CP	mg/kg	8.9	8.3	7.0	30%	Pass	
Cadmium	S17-Ja09851	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S17-Ja09851	CP	mg/kg	6.9	7.3	6.0	30%	Pass	
Copper	S17-Ja09851	CP	mg/kg	22	24	7.0	30%	Pass	
Lead	S17-Ja09851	CP	mg/kg	71	82	15	30%	Pass	
Mercury	S17-Ja09851	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S17-Ja09851	CP	mg/kg	16	14	11	30%	Pass	
Zinc	S17-Ja09851	CP	mg/kg	55	61	11	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S17-Ja09852	CP	mg/kg	20	< 20	22	30%	Pass	
TRH C15-C28	S17-Ja09852	CP	mg/kg	310	230	30	30%	Pass	
TRH C29-C36	S17-Ja09852	CP	mg/kg	170	130	29	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S17-Ja09852	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S17-Ja09852	CP	mg/kg	410	300	30	30%	Pass	
TRH >C34-C40	S17-Ja09852	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S17-Ja09855	CP	%	14	17	19	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-Ja09858	CP	mg/kg	20	30	38	30%	Fail	Q15
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-Ja09858	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-Ja09858	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S17-Ja09858	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S17-Ja09858	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S17-Ja09858	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S17-Ja09858	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-Ja09858	CP	mg/kg	< 0.5	0.9	200	30%	Fail	Q15
TRH C6-C10	S17-Ja09858	CP	mg/kg	31	46	40	30%	Fail	Q15
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S17-Ja09858	CP	mg/kg	0.7	0.8	12	30%	Pass	
Fluorene	S17-Ja09858	CP	mg/kg	0.7	0.7	9.0	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S17-Ja09858	CP	mg/kg	1.7	1.6	7.0	30%	Pass	
Phenanthrene	S17-Ja09858	CP	mg/kg	1.4	1.5	11	30%	Pass	
Pyrene	S17-Ja09858	CP	mg/kg	1.2	1.2	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S17-Ja09858	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-Ja09858	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S17-Ja09858	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-Ja09858	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S17-Ja09858	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2.4-Dichlorophenol	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dimethylphenol	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S17-Ja09858	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S17-Ja09858	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Phenol	S17-Ja09858	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S17-Ja09858	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S17-Ja09858	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
2-Chlorophenol	S17-Ja09858	CP	mg/kg	1.8	1.6	8.0	30%	Pass	
2-Nitrophenol	S17-Ja09858	CP	mg/kg	< 1	< 1	<1	30%	Pass	
4-Chloro-3-methylphenol	S17-Ja09858	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S17-Ja09858	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S17-Ja09859	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-Ja09859	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S17-Ja09859	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-Ja09859	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S17-Ja09859	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S17-Ja09859	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S17-Ja09859	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S17-Ja09859	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S17-Ja09859	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S17-Ja09859	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S17-Ja09859	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S17-Ja09862	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S17-Ja09862	CP	mg/kg	56	69	21	30%	Pass	
TRH C29-C36	S17-Ja09862	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S17-Ja09862	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S17-Ja09862	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S17-Ja09862	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S17-Ja09865	CP	%	24	23	3.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-Ja09868	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-Ja09868	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-Ja09868	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S17-Ja09868	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S17-Ja09868	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S17-Ja09868	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S17-Ja09868	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S17-Ja09868	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Speciated Phenols				Result 1	Result 2	RPD			
2.4-Dichlorophenol	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dimethylphenol	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S17-Ja09868	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S17-Ja09868	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Phenol	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S17-Ja09868	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S17-Ja09868	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
2-Chlorophenol	S17-Ja09868	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Nitrophenol	S17-Ja09868	CP	mg/kg	< 1	< 1	<1	30%	Pass	
4-Chloro-3-methylphenol	S17-Ja09868	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S17-Ja09868	CP	mg/kg	< 1	< 1	<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 QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Attention:	Steven Drysdale
Report	530963-AID
Project Name	CAMPSIE DSI
Project ID	59917080
Received Date	Jan 19, 2017
Date Reported	Jan 27, 2017

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name CAMPSIE DSI
Project ID 59917080
Date Sampled Jan 17, 2017 to Jan 18, 2017
Report 530963-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BH7_0.2	17-Ja09848	Jan 18, 2017	Approximate Sample 24g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
MW1_0.8	17-Ja09849	Jan 18, 2017	Approximate Sample 33g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
MW1_4.0	17-Ja09850	Jan 18, 2017	Approximate Sample 36g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
MW3_0.8	17-Ja09851	Jan 18, 2017	Approximate Sample 30g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH5_0.2	17-Ja09852	Jan 18, 2017	Approximate Sample 14g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH1_1.0-1.5	17-Ja09853	Jan 18, 2017	Approximate Sample 32g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH1_2.4	17-Ja09854	Jan 18, 2017	Approximate Sample 60g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH2_0.5	17-Ja09855	Jan 18, 2017	Approximate Sample 49g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH2_2.4	17-Ja09856	Jan 18, 2017	Approximate Sample 89g Sample consisted of: Red-brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH4_1.5	17-Ja09857	Jan 18, 2017	Approximate Sample 45g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
BH4_2.5	17-Ja09858	Jan 18, 2017	Approximate Sample 46g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH3_1.8	17-Ja09859	Jan 18, 2017	Approximate Sample 33g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH3_3.0	17-Ja09860	Jan 18, 2017	Approximate Sample 40g Sample consisted of: Red-brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH10_1.8	17-Ja09861	Jan 17, 2017	Approximate Sample 40g Sample consisted of: Light brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH9_1.0	17-Ja09862	Jan 17, 2017	Approximate Sample 34g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH8_0.5	17-Ja09863	Jan 17, 2017	Approximate Sample 78g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH6_1.2	17-Ja09864	Jan 17, 2017	Approximate Sample 35g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
BH6_1.8	17-Ja09865	Jan 17, 2017	Approximate Sample 131g Sample consisted of: Red-brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
MW2_1.0	17-Ja09866	Jan 17, 2017	Approximate Sample 95g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
MW2_4.5	17-Ja09867	Jan 17, 2017	Approximate Sample 45g Sample consisted of: Light brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
QA1	17-Ja09868	Jan 17, 2017	Approximate Sample 63g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.

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
Asbestos - LTM-ASB-8020	Sydney	Jan 23, 2017	Indefinite

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Site # 1254 & 14271

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Site # 18217

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065

Project Name: CAMPSIE DSI
Project ID: 59917080

Order No.:
Report #: 530963
Phone: 02 9496 7822
Fax: 02 9499 3902

Received: Jan 19, 2017 1:46 PM
Due: Jan 27, 2017
Priority: 5 Day
Contact Name: Steven Drysdale

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Speciated Phenols	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 18217															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	BH7_0.2	Jan 18, 2017		Soil	S17-Ja09848	X		X	X	X	X	X	X	X	X
2	MW1_0.8	Jan 18, 2017		Soil	S17-Ja09849	X		X	X	X	X	X	X	X	X
3	MW1_4.0	Jan 18, 2017		Soil	S17-Ja09850	X		X	X	X	X	X	X	X	X
4	MW3_0.8	Jan 18, 2017		Soil	S17-Ja09851	X		X	X	X	X	X	X	X	X
5	BH5_0.2	Jan 18, 2017		Soil	S17-Ja09852	X		X	X	X	X	X	X	X	X
6	BH1_1.0-1.5	Jan 18, 2017		Soil	S17-Ja09853	X		X	X	X	X	X	X	X	X
7	BH1_2.4	Jan 18, 2017		Soil	S17-Ja09854	X		X	X	X	X	X	X	X	X
8	BH2_0.5	Jan 18, 2017		Soil	S17-Ja09855	X		X	X	X	X	X	X	X	X
9	BH2_2.4	Jan 18, 2017		Soil	S17-Ja09856	X		X	X	X	X	X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 18217															
10	BH4_1.5	Jan 18, 2017		Soil	S17-Ja09857	X		X	X	X	X	X	X	X	X
11	BH4_2.5	Jan 18, 2017		Soil	S17-Ja09858	X		X	X	X	X	X	X	X	X
12	BH3_1.8	Jan 18, 2017		Soil	S17-Ja09859	X		X	X	X	X	X	X	X	X
13	BH3_3.0	Jan 18, 2017		Soil	S17-Ja09860	X		X	X	X	X	X	X	X	X
14	BH10_1.8	Jan 17, 2017		Soil	S17-Ja09861	X		X	X	X	X	X	X	X	X
15	BH9_1.0	Jan 17, 2017		Soil	S17-Ja09862	X		X	X	X	X	X	X	X	X
16	BH8_0.5	Jan 17, 2017		Soil	S17-Ja09863	X		X	X	X	X	X	X	X	X
17	BH6_1.2	Jan 17, 2017		Soil	S17-Ja09864	X		X	X	X	X	X	X	X	X
18	BH6_1.8	Jan 17, 2017		Soil	S17-Ja09865	X		X	X	X	X	X	X	X	X
19	MW2_1.0	Jan 17, 2017		Soil	S17-Ja09866	X		X	X	X	X	X	X	X	X
20	MW2_4.5	Jan 17, 2017		Soil	S17-Ja09867	X		X	X	X	X	X	X	X	X
21	QA1	Jan 17, 2017		Soil	S17-Ja09868	X		X	X	X	X	X	X	X	X

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Sample Detail						Asbestos Absence /Presence	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Speciated Phenols	BTEX and Naphthalene	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271															
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 18217															
22	MW3_3.0	Jan 18, 2017		Soil	S17-Ja09869		X								
23	BH10_2.0	Jan 17, 2017		Soil	S17-Ja09870		X								
24	BH9_1.3	Jan 17, 2017		Soil	S17-Ja09871		X								
25	BH8_1.6	Jan 17, 2017		Soil	S17-Ja09872		X								
Test Counts						21	4	21	21	21	21	21	21	21	21

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. 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.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

The samples received were not collected in an approved asbestos bag and was therefore sub-sampled from the 250mL glass jar. Valid sub-sampling procedures were applied so as to ensure that the sub-samples to be analysed accurately represented the samples received.

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
N/A	Not applicable

Authorised by:

Nibha Vaidya Senior Analyst - Asbestos(NSW)

Glenn Jackson
National Operations 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

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3-5 Kingston Town Close
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Phone : +61 8 9251 9600
NATA # 1261 Site # 18217

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

Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Steven Drysdale
Project name:	CAMPSIE DSI
Project ID:	59917080
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jan 19, 2017 1:46 PM
Eurofins | mgt reference:	**530963**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ 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

Samples Ja09849, 09450, 09861, 09867 have had sample IDs changed according to labels on jars as per request from Steven Drysdale.

Contact notes

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

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Steven Drysdale - Steven.Drysdale@cardno.com.au.

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1701520**	Page	: 1 of 9
Client	: **CARDNO (NSW/ACT)**	Laboratory	: Environmental Division Sydney
Contact	: MR STEVEN DRYSDALE	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9496 7700	Telephone	: +61-2-8784 8555
Project	: CAMPSIE DSI 59917080	Date Samples Received	: 23-Jan-2017
Order number	: ----	Date Analysis Commenced	: 23-Jan-2017
C-O-C number	: ----	Issue Date	: 27-Jan-2017
Sampler	: STEVEN DRYSDALE		
Site	: ----		
Quote number	: EN/024/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

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

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

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

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: 729945)									
ES1701497-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	3.8	3.5	8.75	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 730650)									
ES1701276-009	Anonymous	EG005T: Copper	7440-50-8	5	mg/kg	116	108	7.71	0% - 20%
ES1701276-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	42	39	6.96	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	16	22	33.2	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	41	38	6.73	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	251	221	12.8	0% - 20%
ES1701287-008	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	20	6.46	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	8	22.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	17	17	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 730651)									
ES1701276-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1701287-008	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 729889)									
ES1701508-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 729888)									
ES1701508-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	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 (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 729888) - continued									
ES1701508-001	Anonymous	EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 729886)									
ES1701508-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 729886)									
ES1701508-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	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 (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 729886) - continued									
ES1701508-001	Anonymous	EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 729887)									
ES1701508-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 730372)									
ES1701567-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1701569-008	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 729887)									
ES1701508-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 730372)									
ES1701567-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1701569-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 730372)									
ES1701567-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1701569-008	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	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: 730372) - continued									
ES1701569-008	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	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: 730650)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	91.3	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	93.0	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	87.8	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	93.2	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	92.0	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	96.1	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	96.5	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 730651)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.2	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 729889)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	74.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 729888)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	105	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	106	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.2	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	104	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	103	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	103	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.3	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	100	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.2	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	97.7	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	85.2	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	86.2	54	130
EP075(SIM)A: Phenolic Compounds (QCLot: 729886)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 729886) - continued								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	94.0	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	96.9	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	90.7	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	96.9	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	89.6	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	90.2	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	94.1	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	94.6	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	95.2	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	91.9	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	92.8	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	36.0	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 729886)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.4	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	93.2	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	90.7	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	94.6	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	95.5	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	93.6	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	92.5	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	93.1	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.6	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	97.9	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	94.9	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.3	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	92.9	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	91.9	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	93.1	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	92.3	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 729887)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	94.8	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	108	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	99.8	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 730372)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	97.6	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 729887)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	101	77	125

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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 729887) - continued								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	100	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	104	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 730372)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68	128
EP080: BTEXN (QCLot: 730372)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.5	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.9	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	96.5	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.0	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.9	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	104	63	119

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**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 730650)							
ES1701276-009	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	89.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	91.4	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	86.2	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	93.1	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	90.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	96.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 730651)							
ES1701276-009	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	129	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 729889)							
ES1701508-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	113	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 729888)							
ES1701508-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	96.8	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	77.6	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	105	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	106	70	130

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
EP068A: Organochlorine Pesticides (OC) (QCLot: 729888) - continued							
ES1701508-001	Anonymous	EP068: Endrin	72-20-8	2 mg/kg	94.5	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	72.6	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 729886)							
ES1701508-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	95.8	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	95.0	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	87.3	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	94.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	71.0	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 729886)							
ES1701508-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 729887)							
ES1701508-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	98.7	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	106	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	117	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 730372)							
ES1701567-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	130	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 729887)							
ES1701508-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	112	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	114	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	88.6	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 730372)							
ES1701567-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	128	70	130
EP080: BTEXN (QCLot: 730372)							
ES1701567-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	90.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	98.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	92.3	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1701520**	Page	: 1 of 7
Client	: **CARDNO (NSW/ACT)**	Laboratory	: Environmental Division Sydney
Contact	: MR STEVEN DRYSDALE	Contact	: Customer Services ES
Address	: Level 9 The Forum 203 Pacific Highway St Leonards NSW 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9496 7700	Telephone	: +61-2-8784 8555
Project	: CAMPSIE DSI 59917080	Date Samples Received	: 23-Jan-2017 13:45
Order number	: ----	Date Analysis Commenced	: 23-Jan-2017
C-O-C number	: ----	Issue Date	: 27-Jan-2017 17:53
Sampler	: STEVEN DRYSDALE		
Site	: ----		
Quote number	: EN/024/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

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 no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- 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	QA2	----	----	----	----
			Client sampling date / time	18-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1701520-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	**16.2**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**8**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**6**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**22**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**61**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**12**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**60**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
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	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----

eurofins | mgt

Certificate of Analysis

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Steven Drysdale**

Report **533259-W**
Project name CAMPSIE DSI
Project ID 59917080
Received Date Feb 07, 2017

Client Sample ID			**MW1**	**MW2**	**MW3**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S17-Fe07378**	**S17-Fe07379**	**S17-Fe07380**
Date Sampled			**Feb 07, 2017**	**Feb 07, 2017**	**Feb 07, 2017**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	87	121	88
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001

Client Sample ID			MW1	MW2	MW3
Sample Matrix			Water	Water	Water
Eurofins | mgt Sample No.			S17-Fe07378	S17-Fe07379	S17-Fe07380
Date Sampled			Feb 07, 2017	Feb 07, 2017	Feb 07, 2017
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	77	111	63
p-Terphenyl-d14 (surr.)	1	%	87	99	71
Organochlorine Pesticides					
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	< 0.001
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Toxaphene	0.01	mg/L	< 0.01	< 0.01	< 0.01
Dibutylchlorendate (surr.)	1	%	99	58	92
Tetrachloro-m-xylene (surr.)	1	%	52	54	54
Polychlorinated Biphenyls					
Aroclor-1016	0.001	mg/L	< 0.001	< 0.001	< 0.001
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	< 0.001
Aroclor-1232	0.001	mg/L	< 0.001	< 0.001	< 0.001
Aroclor-1242	0.001	mg/L	< 0.001	< 0.001	< 0.001
Aroclor-1248	0.001	mg/L	< 0.001	< 0.001	< 0.001
Aroclor-1254	0.001	mg/L	< 0.001	< 0.001	< 0.001
Aroclor-1260	0.001	mg/L	< 0.001	< 0.001	< 0.001
Total PCB*	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	99	58	92
Tetrachloro-m-xylene (surr.)	1	%	52	54	54
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1
Heavy Metals					
Arsenic (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.003	0.006	0.004
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001

Client Sample ID			MW1	MW2	MW3
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S17-Fe07378**	**S17-Fe07379**	**S17-Fe07380**
Date Sampled			**Feb 07, 2017**	**Feb 07, 2017**	**Feb 07, 2017**
Test/Reference	LOR	Unit			
Heavy Metals					
Nickel (filtered)	0.001	mg/L	0.029	0.003	0.008
Zinc (filtered)	0.005	mg/L	0.18	0.068	0.044

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Feb 10, 2017	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 08, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 10, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Melbourne	Feb 09, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Feb 10, 2017	7 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Feb 10, 2017	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Feb 10, 2017	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8 filtered	Sydney	Feb 08, 2017	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Address: Level 9, 203 Pacific Highway
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NSW 2065

Project Name: CAMPSIE DSI
Project ID: 59917080

Order No.:
Report #: 533259
Phone: 02 9496 7822
Fax: 02 9499 3902

Received: Feb 7, 2017 3:52 PM
Due: Feb 14, 2017
Priority: 5 Day
Contact Name: Steven Drysdale

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8 filtered	BTEX and Naphthalene	BTEX and Naphthalene	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X		X	X	X
Sydney Laboratory - NATA Site # 18217									X	X	X	X
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 18217												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	MW1	Feb 07, 2017		Water	S17-Fe07378	X	X	X	X		X	X
2	MW2	Feb 07, 2017		Water	S17-Fe07379	X	X	X	X	X		X
3	MW3	Feb 07, 2017		Water	S17-Fe07380	X	X	X	X		X	X
Test Counts						3	3	3	3	3	3	3

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
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 & PFASs 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, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene 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 Aroclor 1260 in Matrix Spikes and LCS.
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 RPDs 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	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
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							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	< 0.0001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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 (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	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	86			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	114			70-130	Pass	
Toluene	%	115			70-130	Pass	
Ethylbenzene	%	111			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	106			70-130	Pass	
Xylenes - Total	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	77			70-130	Pass	
Acenaphthylene	%	82			70-130	Pass	
Anthracene	%	79			70-130	Pass	
Benz(a)anthracene	%	81			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	%	89			70-130	Pass	
Benzo(g.h.i)perylene	%	86			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	77			70-130	Pass	
Dibenz(a.h)anthracene	%	105			70-130	Pass	
Fluoranthene	%	74			70-130	Pass	
Fluorene	%	80			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	90			70-130	Pass	
Naphthalene	%	72			70-130	Pass	
Phenanthrene	%	82			70-130	Pass	
Pyrene	%	71			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	76			70-130	Pass	
4.4'-DDE	%	85			70-130	Pass	
4.4'-DDT	%	88			70-130	Pass	
a-BHC	%	75			70-130	Pass	
Aldrin	%	78			70-130	Pass	
b-BHC	%	114			70-130	Pass	
d-BHC	%	76			70-130	Pass	
Dieldrin	%	105			70-130	Pass	
Endosulfan I	%	83			70-130	Pass	
Endosulfan II	%	102			70-130	Pass	
Endosulfan sulphate	%	128			70-130	Pass	
Endrin	%	111			70-130	Pass	
Endrin aldehyde	%	90			70-130	Pass	
Endrin ketone	%	94			70-130	Pass	
g-BHC (Lindane)	%	72			70-130	Pass	
Heptachlor epoxide	%	83			70-130	Pass	
Hexachlorobenzene	%	86			70-130	Pass	
Methoxychlor	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	85			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	M17-Fe07351	NCP	%	124			70-130	Pass	
TRH C10-C14	B17-Fe04518	NCP	%	130			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-Fe05377	NCP	%	126			70-130	Pass	
Toluene	S17-Fe05377	NCP	%	125			70-130	Pass	
Ethylbenzene	S17-Fe05377	NCP	%	124			70-130	Pass	
m&p-Xylenes	S17-Fe05377	NCP	%	117			70-130	Pass	
o-Xylene	S17-Fe05377	NCP	%	119			70-130	Pass	
Xylenes - Total	S17-Fe05377	NCP	%	118			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-Fe05377	NCP	%	110			70-130	Pass	
TRH C6-C10	S17-Fe05377	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	S17-Fe07427	NCP	%	104			70-130	Pass	
Acenaphthylene	S17-Fe07427	NCP	%	109			70-130	Pass	
Anthracene	S17-Fe07427	NCP	%	110			70-130	Pass	
Benz(a)anthracene	S17-Fe07427	NCP	%	103			70-130	Pass	
Benzo(a)pyrene	S17-Fe07427	NCP	%	107			70-130	Pass	
Benzo(b&j)fluoranthene	S17-Fe07427	NCP	%	117			70-130	Pass	
Benzo(g.h.i)perylene	S17-Fe07427	NCP	%	107			70-130	Pass	
Benzo(k)fluoranthene	S17-Fe07427	NCP	%	110			70-130	Pass	
Chrysene	S17-Fe07427	NCP	%	94			70-130	Pass	
Dibenz(a.h)anthracene	S17-Fe07427	NCP	%	123			70-130	Pass	
Fluoranthene	S17-Fe07427	NCP	%	94			70-130	Pass	
Fluorene	S17-Fe07427	NCP	%	112			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-Fe07427	NCP	%	110			70-130	Pass	
Naphthalene	S17-Fe07427	NCP	%	130			70-130	Pass	
Phenanthrene	S17-Fe07427	NCP	%	116			70-130	Pass	
Pyrene	S17-Fe07427	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M17-Fe05663	NCP	%	129			70-130	Pass	
4.4'-DDE	M17-Fe05663	NCP	%	104			70-130	Pass	
4.4'-DDT	M17-Fe05663	NCP	%	102			70-130	Pass	
a-BHC	M17-Fe05663	NCP	%	74			70-130	Pass	
Aldrin	M17-Fe05663	NCP	%	85			70-130	Pass	
b-BHC	M17-Fe05663	NCP	%	108			70-130	Pass	
d-BHC	M17-Fe05663	NCP	%	100			70-130	Pass	
Dieldrin	M17-Fe05663	NCP	%	98			70-130	Pass	
Endosulfan I	M17-Fe05663	NCP	%	91			70-130	Pass	
Endosulfan II	M17-Fe05663	NCP	%	95			70-130	Pass	
Endosulfan sulphate	M17-Fe05663	NCP	%	120			70-130	Pass	
Endrin	M17-Fe05663	NCP	%	99			70-130	Pass	
Endrin aldehyde	M17-Fe05663	NCP	%	89			70-130	Pass	
Endrin ketone	M17-Fe05663	NCP	%	122			70-130	Pass	
g-BHC (Lindane)	M17-Fe05663	NCP	%	95			70-130	Pass	
Heptachlor	M17-Fe05663	NCP	%	88			70-130	Pass	
Heptachlor epoxide	M17-Fe05663	NCP	%	96			70-130	Pass	
Hexachlorobenzene	M17-Fe05663	NCP	%	83			70-130	Pass	
Methoxychlor	M17-Fe05663	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B17-Fe04518	NCP	%	130			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	S17-Fe07436	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S17-Fe05971	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S17-Fe05971	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S17-Fe05971	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-Fe07038	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S17-Fe07038	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S17-Fe07038	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S17-Fe07038	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S17-Fe07038	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S17-Fe07038	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-Fe07038	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S17-Fe07038	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M17-Fe04464	NCP	mg/L	0.003	0.004	14	30%	Pass	
Phenanthrene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M17-Fe04464	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
a-BHC	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	M17-Fe05239	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Toxaphene	M17-Fe05239	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1221	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1232	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1242	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1248	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1254	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1260	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total PCB*	M17-Fe05239	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S17-Fe05971	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S17-Fe05971	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S17-Fe05971	NCP	mg/L	< 0.1	< 0.1	<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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please click here.

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Sample Receipt Advice

Company name:	**Cardno (NSW/ACT) Pty Ltd**
Contact name:	Steven Drysdale
Project name:	CAMPSIE DSI
Project ID:	59917080
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Feb 7, 2017 3:52 PM
Eurofins | mgt reference:	**533259**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ 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:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Steven Drysdale - Steven.Drysdale@cardno.com.au.

Cardno
Shaping the Future

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Contact Person:	Steven Drysdale	Project Name:	Campsie Dsi
Telephone Number:	94967748	Project Number:	59917080
Alternative Contact:	Hugh Selby	PO No.:	
Telephone Number:	94967700	Project Specific Quote No. :	
Sampler:	Steven Drysdale	Date results required:	Standard
Email Address (results and invoice):	steven.drysdale@cardno.com.au	Report format:	
Address: Level 9 - The Forum, 203 Pacific Highway, St Leonards, New South Wales 2065			

533259

Sample Information						Analysis Required											Comments
Cardno Sample ID	Laboratory Sample ID	No. Containers	Preservation	Date sampled	Matrix	TPH / BTEXN / PAH	PCB / OCP	Heavy Metals (8)									
MW1		4		7/02/2017	Water	X	X	X									
MW2		4		7/02/2017	Water	X	X	X									Insufficient sample volume. Run what is possible.
MW3		4		7/02/2017	Water	X	X	X									

Relinquished by: (name / company)	S. Drysdale Cardno NSW/ACT	Received by (name / company)	Scott Cardno Eurofins/MGT	Relinquished by: (name / company		Received by: (name / company)	Relinquished by: (name / company)
Date & Time:	7/02/2017 1548	Date & Time:	7/2/17 15:52	Date & Time:		Date & Time:	Date & Time:
Signature:		Signature:		Signature:		Signature:	Signature:
Received by: (name / company)		Relinquished by: (name / company)		Received by: (name / company		Relinquished by: (name / company)	*Lab use:* Samples Received: Cool or Ambient (circle one)
Date & Time:		Date & Time:		Date & Time:		Date & Time:	Temperature Received at: (if applicable)
Signature:		Signature:		Signature:		Signature:	Transported by: Hand delivered / courier

07 FEB 2017 15:52

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QA2	----	----	----	----
				Client sampling date / time	18-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1701520-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
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	72-54-8/72-55-9/50-2	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	----	----	----	----
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		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QA2	----	----	----	----
				Client sampling date / time	18-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1701520-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	----	----	----
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		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >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	%		**108**	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**126**	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QA2	----	----	----	----
				Client sampling date / time	18-Jan-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1701520-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**68.4**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**92.7**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**86.4**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**94.9**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**99.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**103**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**108**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**84.1**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**106**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**114**	----	----	----	----

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	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130