Proposed Expansion of Cessnock Correctional Centre Phase 2 Contamination Assessment

Lindsay Street, Cessnock

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1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) is pleased to present this Phase 2 Contamination Assessment (CA) report to Lend Lease for the proposed expansion of Cessnock Correctional Centre, located on a part of Lot 3 DP76202, Lindsay Street, Cessnock. The approximate site location is shown on Figure 1, Appendix A.

Based on information and drawings provided by Lend Lease, the development is understood to comprise a *'240 minimum security development'* covering an irregular 'L' shaped area and two rectangular shaped areas, comprising a total site area of about 50,944m^2 (5.1ha). The development comprises the new minimum security beds, new administration buildings, car parking, roads and recreational facilities.

A Preliminary Site Investigation (Contamination) (PSI) was carried out by Douglas Partners Pty Ltd (DP), in July 2016, ref: 81986.00.R.002.Rev0, dated 6 July 2016. The PSI covered five areas (Area 1 to 5) within the Cessnock Correctional Centre, and Areas 1 and 4 are within the proposed expansion area which is the subject of this report. It is noted that the proposed expansion also covers an area outside of the PSI Areas 1 to 5.

For the purposes of this assessment the 'site' is defined as the area for the proposed 240 bed development, and associated administration buildings and car parking, as shown on Figure 1, Appendix A.

This report was prepared in accordance with the relevant sections of the NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.

2.0 Objectives

The objectives of the CA were to:

- Assess the presence and extent of soil contamination (if any) within the Areas of Environmental Concern (AECs), previously identified at the site by DP (2016);
- Develop a Conceptual Site Model (CSM) for the site based on the findings of the assessment; and
- Provide recommendations for further assessments, remediation and/or management, as required.

3.0 Scope of Works

In order to meet the above objectives, Qualtest carried out the following scope of works:

- Review of the relevant sections of DP (2016) PSI report;
- A site walkover;
- Collection of soil samples from 60 locations (10 test pits and 50 surface samples);
- Laboratory analysis of soil samples for Chemicals of Potential Concern (COPC) identified by DP (2016); and
- Preparation of a Phase 2 Contamination Report, including a preliminary waste classification of the material and options for onsite re-use and/or disposal.

4.0 Site Description

4.1 Site Identification

The site is located to the south east of the existing Cessnock Correctional Centre located at Lindsay Street, Cessnock, NSW, as shown in Figure 1. The site is three parcels of land, which are part of Lot 3 DP76202. The site covers an area of approximately 5.1 hectares (ha) and is surrounded by the Cessnock Gaol grounds, with a golf course located further to the south and east.

4.2 Topography and Drainage

Reference to the NSW Land and Property Information Spatial Information Exchange website (https://six.nsw.gov.au/wps/portal/) indicated the elevation of the site ranged from approximately 100m AHD in the western portion of the site to 90m AHD in the eastern portion of the site.

During field investigations the northwestern portion of the site surface was observed to slope towards the west-southwest. The majority of the site surface was observed to slope to the south east.

Surface water would be expected to infiltrate into site soils, with excess surface water from the site draining towards the unnamed creek located approximately 400m to 450m south and southeast of the site. The unnamed creek flows through a series of dams before discharging to Black Creek, located approximately 2.2km to the north east of the site.

4.3 Regional Geology

Reference to the 1:250,000 Singleton Regional Geology Sheet (S56-1, 1969) indicates that the site is underlain by the Rutherford Formation of the Dalwood Group which is characterised by mudstone, conglomeratic sandstone, sandstone and shale rock types.

4.4 Hydrogeology

Groundwater beneath the site is anticipated be present in unconfined to semi-confined aquifers in residual soils or weathered rock greater than 10m below ground surface (bgs). Groundwater flow direction from beneath the site is anticipated to follow the surface topography and flow to the east to southeast and eventually discharge to Black Creek, located approximately 2.2km to the north east of the site.

It should be noted that groundwater conditions can vary due to rainfall and other influences including regional groundwater flow, temperature, permeability, recharge areas, surface condition, and subsoil drainage.

A search of the NSW Department of Primary Industries (Office of Water) registered groundwater bores located within a 500m radius of the site was undertaken. The search revealed that there was no registered bore within this radius. There was one registered groundwater bore 1.2 km from the site. A copy of the search is provided in Appendix D and summaries below in Table 4.1.

Table 4.1 – Summary of Groundwater Bore Data

Bore ID	Status	Purpose	Approximate Distance and Gradient from Site	Water Bearing Zone (m bgs)
GW200249	Active	Test Bore	1.2km south west, cross-gradient	16 to 18

4.5 Acid Sulfate Soils

Reference to the Cessnock Acid Sulfate Soil Risk Map (1:25,000 scale, 1997 Edition Two, supplied by the NSW Department of Land and Water Conservation) indicates that the site is located within an area of "no known occurrence" of Acid Sulfate Soils (ASS).

4.6 Review of Previous Assessments

There was one known previous report on the site prepared by Douglas Partners Pty Ltd (DP) Report on Preliminary Site Investigation (Contamination) Redevelopment of Cessnock Correctional Centre, ref: 81986.00R.002.Rev0 dated 6 July 2016 (DP, 2016).

DP was engaged to undertake a preliminary assessment for the proposed redevelopment of the Cessnock Correctional Centre. The DP (2016a) assessment covered a larger area than the subject of this current report, and included five Areas:

- Area 1: Additional 280 bed minimum security facility and ancillary supporting infrastructure on the vacant land to the south of the existing centre;
- Area 2: Additional 320 bed maximum security facility and ancillary supporting infrastructure on the land west of the existing centre;
- Area 3: Construction of a new staff amenities building, admin building and car park to the south of the existing maximum security facility;
- Area 4: Construction of approximately 250m of new access road connecting the proposed car park to the existing Alunga Ave; and,
- Area 5: Construction of a new max industries building within the proposed maximum security area.

Areas 1 was located within the footprint of the current site, forming the southern portion, and portion of Area 4 was also within the site, forming the southern edge of the current site. The DP (2016) assessment did not cover the northern portion of the current site, which extends east of the existing Industries building and into the maximum security area. This review only covers the parts of the DP (2016) report which are relevant to the current site. Figure 2 shows the five areas assessed by DP (2016).

The DP (2016) assessment comprised:

- A desktop review of site history, including;
    - Discussion with personnel familiar with the site;
    - Search of historical title deeds
    - Review of historical aerial photographs; and,
    - Search of NSW EPA contaminated land databases;
- Site walkover on 25 May 2016 by a senior engineer from DP; and
- Preparation of the preliminary assessment report.

Discussion with Site Personnel

DP undertook discussion with the prison officer in charge of the western area of DP's site (Areas 2, 3 and 5). Generally, this was not applicable to the current site, however a brief summary is provided below:

- The western portion of the centre was used for storage of demountable buildings. The demountable buildings were not subjected to demolition or repair work on the site. A separate area within the existing minimum security unit was identified as being where refurbishment and handling of asbestos products occurred;
- Some cut and fill operations were undertaken during development of the site, particularly in Area 2;
- Spraying of weeds was periodically undertaken across the site.

Historical Titles

The historical titles showed that Areas 1 and 4 were owned by private individuals from 1926 to 1962, who included a gentleman, vigneron, and a butcher. The areas had been owned by the Minister for Public Works (1962 to 1989) and Minister for Corrective Services (1989 to present), indicating the correctional centre had been present since the early 1960's.

Historical Aerial Photos

DP reviewed photographs from 1952 to 2012. DP did not include the aerial photographs in the report, therefore Qualtest have relied on DP's descriptions of the photographs. Below is the DP (2016) description of the photographs for Areas 1 and 4 (the current site).

Year	***Scale (Colour)***	***Main Observations***
1952	*1:40,000 (B & W)*	*No development visible on the site, which is open paddocks. Main access road and Alunga Avenue not visible. Surrounding land is predominately undeveloped.*
1975	*1:40,000 (B & W)*	*Similar to 1952 aerial photo and the site remains undeveloped. Alunga Avenue and main access road are visible. Houses visible along Alunga Avenue. The main gaol buildings are visible to the west, although the three large buildings north of Area 1 are not visible.*
1980	*1:25,000 (B & W)*	*Similar to 1975 photo.*
1996	*1:25,000 (Colour)*	*One or two buildings, believed to be demountable buildings appear to be stored within the northern section of Area 1. The drainage swale/bund which is present in Area 1 is visible.*
2005	*Not to scale (Colour)*	*Similar to 1996 photo.*
2007	*Not to scale (Colour)*	*Similar to 2005 photo, although demountables have been removed. More demountables are still present further to the north, beyond Area 1 [it is not known if this is within the current site].*

Year	*Scale (Colour)*	*Main Observations*
2010	*Not to scale (Colour)*	*Similar to 2007 Google Earth image although construction of three large buildings to the north well underway.*
2012	*Not to scale (Colour)*	*Similar to 2010 Google Earth image but three large buildings in present day minimum security unit complete along with sealed access road on western boundary of Area 1.*

NSW EPA Search

DP review of the NSW EPA public registers indicated that the site was not on the Contaminated Land Management Register, and had not been on the list of contaminated sites that had been notified to NSW EPA. The site and nearby sites are not on the Protection of the Environment Operations Act list for licenses or notices.

DP Geotechnical Investigation

DP carried out a geotechnical investigation concurrently with the preliminary contamination assessment, and also reviewed previous DP geotechnical investigation reports for the correctional centre. The PSI (DP, 2016) included a summary of the subsurface profile from the geotechnical report. The boreholes for the geotechnical investigation were drilled to depths between 0.4m and 6.0m. Conditions encountered in the boreholes included some near surface filling underlain by residual clay soils and shallow sandstone bedrock.

Where encountered, filling was generally clayey silt, silty clay or silty sand which appeared to have been sourced from excavations elsewhere on the site during creation of the near-level terraces (particularly in Area 2). No anthropogenic inclusions were noted on the drill logs.

Site Description

Areas 1 and 4 are located south of the existing Industries buildings, and north of residential houses on Alunga Avenue. Below are the main features and observations made by DP (2016):

- The area was typically grass covered with scattered trees. An existing concrete access road passed in an east/west direction through the northern portion of Area 1;
- The site sloped generally down to the south-east at about 3-5°; and,
- Several swales and bunds were present, generally aligned north-east to south-west across the site and appeared to act as surface drainage diversions.

Soil Sampling and Analysis

DP (2016) collected two samples from Area 1 (samples 306 and 307) and analysed them for asbestos (presence/absence). The stated objective of the sampling was to "partly address" the identified contaminant of concern associated with former storage of demountable buildings and demolition of previous buildings.

DP (2016) did not provide information on the sampling methodology, including the depth samples were collected. It is assumed based on the sampling objective that the samples were collected from the site surface.

No asbestos was detected in the two samples, 306 and 307.

Potential Contamination

DP (2016) identified three Areas of Environmental Concern (AECs):

- *"Potential application of herbicides and pesticides during weed control and associated with the former land use (viticulture), with potential contaminants including pesticides, herbicides, metals, TRH, grease and oil;*
- *Previous storage of demountable buildings (Areas 1, 2, 3, and 5) along with demolition of previous buildings (Area 3), which may have resulted in asbestos being deposited on the soil surface. Preliminary and limited testing of surface soils within Area 1 to 3 did not detect the presence of asbestos fibres;*
- *Possible importation of filling, or excavation and placement of site won materials associated with the near level terraces in Area 2, the detention basin (now filled in) in Area 2 and the drainage bunds in Area 1. Filling may also be present in Area 3. The filling may contain potential contamination such as asbestos containing material, TRH, BTEX, PAH, PCB, OCP, OPP and Metals."*

DP concluded that: *"Although there were no visual or olfactory signs of gross contamination (i.e. no obvious staining or odour) observed on site or within the test bores undertaken for the concurrent geotechnical investigation, the presence of fill materials and the previous land usage (storage of demountable buildings and viticulture) indicated that contamination may be present at the site. It is noted that while a concurrent geotechnical investigation has been undertaken at the site, no sampling and testing for chemical contaminants was conducted for the PSI, apart from limited testing for asbestos.*

The presence or absence of contamination can only be confirmed by further investigation including environmental sampling and chemical testing.

It is, however, considered that the areas of potential contamination identified, once remediated, will be suitable for the proposed land use."

DP (2016) recommended: *"Further targeted contamination assessment, including intrusive investigation within the identified areas of environmental concern together with testing for likely contaminants should be undertaken to assess the possible presence and extent of contamination and requirements for remediation, particularly for asbestos and herbicides."*

4.7 Aerial Photograph Review

In order to assess the portions of the site not covered in the previous PSI (DP, 2016), Qualtest carried out an additional review of aerial photographs between 1961 and 2018 from Department of Finance, Services and Innovation (Spatial Services) and Nearmaps (http://maps.au.nearmap.com/, accessed on 6 June 2018). Descriptions of the aerial photographs are below, and a copy of the aerial photographs are included in Appendix C.

Table 4.2 – Historical Aerial Photographs

Date	Description
1961	The gaol has not been constructed and the site is cleared vacant land. A few dams are visible, it is difficult to assess whether they are on the site due to a lack of landmarks.
1976	The original gaol has been constructed. The portions of the gaol which comprise the site are generally vacant cleared land. ***Proposed Carpark*** Vacant cleared land with no structures visible. A small car park is located immediately north of the area. ***Proposed Administration*** The proposed administration area is within the prison fence, but no structures are visible. To the southeast of the prison fence is a small white structure, but it is not clear what the structure is. ***Proposed 240 Bed Minimum Security Area*** Vacant cleared land with a few access tracks and drainage lines visible. Immediately to the south of the site, residences have been constructed.
1994	***Proposed Carpark*** Similar to 1976 photograph. Vacant cleared land with no structures visible. A small car park is located immediately north of the area. ***Proposed Administration*** The proposed administration area is within the prison fence. The roughly circular building has been constructed, and has a brown tile roof. There are no other structures visible. ***Proposed 240 Bed Minimum Security Area*** The area is vacant cleared land. A wide drainage channel has been formed running roughly northeast to south west through the area. Immediately north of the area there are 12 structures visible, which appear to be demountable buildings, it is noted these are not located on the site.
June 2010	***Proposed Carpark*** Vacant grassed land. ***Proposed Administration*** There are a number of small structures, associated with seating and playground areas for visitors. The roughly circular building is present. ***Proposed 240 Bed Minimum Security Area*** Predominately vacant grassed land with scattered trees. There are a number of tracks and drainage swales. In the northern portion there is a stockpile of soil. In the southern portion, there are a number of white square shapes along a track or swale drain, it is not known what they are but they may be associated with construction of stormwater pits and drains.

Date	Description
Sept 2014	***Proposed Carpark*** Similar to 2010 photograph. ***Proposed Administration*** Similar to 2010 photograph. The roof of the roughly circular building has been replaced with a metal sheeting roof (i.e. Colorbond). ***Proposed 240 Bed Minimum Security Area*** Similar to 2010 photograph. A new concrete pathway is present in the northern portion, and the stockpile of soil is no longer visible. In the southern portion, the white boxes are no longer visible.
Jan 2017	***Proposed Carpark*** Several demountable buildings are present in the southern part of the proposed car park. A new car park area is present in the northern part. ***Proposed Administration*** Similar to 2014 photograph. ***Proposed 240 Bed Minimum Security Area*** Similar to 2014 photograph. A structure is present in the northern portion, in a similar location to a demountable building currently present on site.
Feb 2018	***Proposed Carpark*** The demountable buildings are no longer present in the southern part, however evidence from the former buildings is visible (i.e. brown grass and areas with no grass). The car park area is present in the northern part. ***Proposed Administration*** Similar to 2017 photograph. ***Proposed 240 Bed Minimum Security Area*** Similar to 2017 photograph.

5.0 Field Investigations

5.1 Site Observations

A site walkover was carried out on 8 June 2018 and soil sampling was undertaken between the 8 to 15 June 2018 by an experienced Qualtest Environmental Scientist. The sampling locations are shown on Figures 3 and 4. Photographs taken during the works are shown below.

The site observations noted during the field works are summarised below:

- The majority of the site was observed to be maintained grass lands with scattered mature trees and shrubs (Photographs 1and 2);
- The current visiting/leisure area was located within the northern area of the site. A brick building which roughly circular in shape was present, and several small sheltered seating and playground areas are present (Photograph 3);
- A paved access road from Lindsay Street to the site offices runs through the centre of the site (Photograph 4).
- A demountable building is present in the northern portion of the site. The building is connected to power and appears to be used, and not placed for storage (Photograph 5);
- A number of fill mounds and swales were observed in the centre and southern portions of the site. Fill mounds were present around the existing fence of the prison (Photographs 1, 4 and 6); and
- The eastern portion of the site comprises of a flat vacant grass covered area.

Photo 1 – showing general site, and small fill mound in foreground

Photo 2 – showing general site

Photo 3 – showing visitor area of maximum security area

Photo 4 – showing paved road and path through centre of the site

Photo 5 – showing demountable building in the northern portion

Photo 6 – showing paved road and prison fence

5.2 Soil Sampling

Samples were collected from 50 surface soil sample locations (SS1 to SS50) and 10 test pit locations (TP01 to TP10) in a 30m grid pattern across the site. The test pits were used in grid locations that intersected swales or areas of fill. The sampling locations are shown in Figures 3 and 4 attached.

The number of sample locations was in accordance with the NSW EPA (1995) Sampling Design Guidelines which recommend a minimum of 60 locations for a site of 5.1ha. The surface samples were collected using hand tools from the top 0.1m of the site. A clean pair of disposable nitrile gloves were used to collect each sample, and the hand tools were decontaminated between sampling locations using a phosphate free detergent and potable water.

The test pits were excavated using an excavator, to depths of between 0.75m and 2.5m bgs (a minimum of 0.5m into natural soils). Soil samples were collected directly from the excavator bucket using a clean pair of disposable nitrile gloves for each sample.

The soil samples (excluding for asbestos analysis) were placed into 250mL laboratory supplied glass jars, and zip-locked bags for headspace screening using a Photolonisation Detector (PID). The jar samples were placed directly into an ice-chilled esky and remained chilled during transportation to the laboratory.

Each surface sample (including surface samples from test pit locations) were assessed for asbestos using the following procedures, in accordance with the WA Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (WA DoH 2009 Guidelines):

- A 10L sample was collected in a bucket;
- The 10L sample was weighed and passed through a ≤7mm sieve;
- If potential bonded asbestos containing materials (ACM) were captured on the sieve, these were then weighed in relation to the weight of the 10L sample; and
- A separate 500mL wetted sample was collected into a plastic bag which was secured, and then placed into a secure satchel for transport.

The asbestos sampling was carried out in accordance with the WA DoH 2009 Guidelines, in regards to the number of sample locations and the sampling methodology.

6.0 Laboratory analysis

The samples were dispatched to the NATA-accredited Eurofins MGT laboratory in Oakleigh, VIC under chain of custody conditions.

The soil samples were analysed for the following:

- Asbestos (ID) – 1 primary sample (fragment of Potential ACM);
- Asbestos (w/w) – 60 primary samples;
- Total Recoverable Hydrocarbons (TRH) – 30 primary soil samples;
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX) – 30 primary soil samples;
- Polycyclic Aromatic Hydrocarbons (PAHs) – 30 primary soil samples;
- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) – 30 primary soil samples;
- Organochlorine Pesticides (OCP) – 14 primary soil samples;
- OPPs, PCBs and Herbicides – 14 primary soil samples; and
- pH and Cation Exchange Capacity (CEC) – 3 primary samples.

7.0 Investigation Criteria

7.1 Health and Ecological Levels (Soil)

The health and ecological investigation levels for soil, presented in the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013*, Canberra (referred to as NEPM 2013) are generally used in NSW when selecting investigation levels for chemical contaminants in soil.

The purpose of the NEPM (2013) is to *'establish a nationally consistent approach to the assessment of site contamination to ensure sound environmental management practices by the community which includes regulators, site assessors, environmental auditors, landowners, developers and industry'.*

NEPM (2013) provides health and ecological investigation and screening levels for different exposure scenarios based on a proposed land use. Health and ecological investigation and screening levels are applicable to the first stage (Tier 1) of site assessment and are used to assist in the iterative development of a Conceptual Site Model (CSM). They are adopted as concentrations of a contaminant above which either further appropriate investigation and/or evaluation will be required, or development of an appropriate management strategy (including remediation).

Health Investigation Levels (HILs) and Health Screening levels (HSLs) are applicable for assessing human health risk via relevant exposure pathways.

The HILs were developed for a broad range of metals and organic substances. These are generic to all soil types.

The HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation and direct contact with soil and

groundwater. The HSLs depend on specific soil physicochemical properties, building configurations, land use scenarios and the depth that groundwater is encountered.

Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) are applicable for assessing risk to terrestrial ecosystems under residential, open space and commercial/industrial land use scenarios. They apply to the top 2m of soil, which corresponds to the root zone and habitation zone of many species.

The EILs are associated with selected metals and organic compounds. The EILs are site specific and are determined by calculating an Ambient Background Concentration (ABC) and an Added Contaminant Limit (ACL) for the site, which are added together to get the EIL. In the absence of ambient background concentration data, a generic ACL, based on the soils pH, Cation Exchange Capacity (CEC) and clay content, has been adopted.

The ESLs are associated with petroleum compounds and fractions and are dependent on specific soil physical properties (i.e. coarse and fine-grained soil).

Based on the proposed site use the investigation and screening levels for residential land use with accessible soil have been adopted, and are shown in Tables 1 to 3, Appendix B.

7.2 Asbestos Materials in Soil

The assessment of known and suspected asbestos contamination in soil is based on:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (April 2013), NEPC 2013, Canberra; and
- *WA DoH (2009) Guidelines of the assessment and management of asbestos contaminated sites in Western Australia, WA Department of Health and Department of Environment and Conservation.*

Schedule B1, Section 4 NEPM (2013) provides guidance on the assessment of both friable and non-friable forms of asbestos in soil. This guidance is based on the WA DoH (2009) Guidelines that presented risk based screening levels for asbestos in soil under various landuse scenarios.

For the purpose of assessing asbestos impacts in soil, three groups are recognised:

- Asbestos Containing Material (ACM) - *which is in sound condition although possibly broken or fragmented and the asbestos is bound in a matrix. This is restricted to material that cannot pass through a 7mm x 7mm sieve;*
- Fibrous asbestos (FA) - *friable asbestos material, such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products;*
- Asbestos fines (AF) - *includes free fibres of asbestos, small fibre bundles and also ACM fragments that pass through a 7mm x 7mm sieve.*

The health screening levels for asbestos in soil for residential land use with accessible soils have been adopted:

Form of Asbestos	**HSL A**
Bonded ACM %	0.01
FA and AF %	0.001
All forms of asbestos	No visible evidence for surface soil (top 10cm)

The calculation used to determine the %weight of ACM fragments in soil has been derived from the WA DoH (2009) Guidelines and enHealth, 2005, *Management of asbestos in the non-occupational environment* (enHealth,2005). The quantity of asbestos in soil is estimated as follows:

$$\%w/w \text{ asbestos in soil} = \frac{\% \text{ asbestos content x bonded ACM (kg)}}{\text{Soil volume (L) x Soil density (kg/L)}}$$

The % asbestos content (within bonded ACM) was 12% based on laboratory testing, and the weighing of samples in the field showed a soil density of 1.0kg/L for the sample where ACM was detected.

7.3 Preliminary Waste Classification

In order to provide a preliminary waste classification for the soils across the site, the laboratory results were compared to the Contaminant Threshold (CT) and Specific Contaminant Concentration (SCC) values for General and Restricted Solid Waste in the NSW EPA (2014) *Waste Classification Guidelines*.

The adopted waste classification criteria are presented in the attached Table 4, Appendix B.

8.0 Quality Assurance/Quality Control

Sampling activities were undertaken in accordance with normal, industry accepted practices and standards. In order to assess field QA / QC procedures the following QA/QC samples were collected during the soil sampling programme.

Table 8.1 – QC Samples

QC Sample ID	Sample Type	Lab	Analysis
QC1	Duplicate of SS1	Eurofins mgt	TRH, BTEX, PAH, Metals, OCP, OPP, PCB
QC2	Rinsate / Wash Blank	Eurofins mgt	TRH, BTEX, PAH, Metals, OCP, OPP, PCB
QC3	Trip Blank	Eurofins mgt	BTEX
QC6	Duplicate of TP01 0.0-0.1	Eurofins mgt	TRH, BTEX, PAH, Metals
QC7	Triplicate of TP01 0.0-0.1	ALS	TRH, BTEX, PAH, Metals
QC8	Trip Blank	Eurofins mgt	BTEX

Primary and intra lab duplicate samples were analysed by the NATA-accredited Eurofins-MGT laboratory in Oakleigh, VIC. Inter lab duplicate samples were analysed by the NATA-accredited Australian Laboratory Service (ALS) laboratory in Springvale, VIC.

Table 5 presents the relative percentage differences (RPDs) between the primary and duplicate samples and the results of the trip blank sample. A review of the Qualtest QA / QC results indicates that RPDs were within the acceptable range of 30%. It is noted that the RPDs have only been considered where a concentration is greater than 10 times the laboratory limit of reporting (LOR) as small concentrations exaggerate the percentage differences.

Table 6 presents the results of the trip blank samples and the equipment rinsate sample, which showed concentrations were below detection limits.

The laboratory internal QA/QC reports indicated that the appropriate laboratory QA / QC procedures and rates were undertaken for contamination studies, and that:

- Laboratory blank samples were free of contamination;
- Matrix spike recoveries were within the control limits;
- Laboratory duplicate RPDs were recorded within the control limits, with the exception of an RPD for TRH C29-C36. The lab quoted code Q15, which states: *"The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report"*. Based on this, the RPD recorded is not considered to affect the usability of the data; and
- Surrogates and laboratory control samples were within the laboratories acceptable ranges.

Based on the above it is considered that the field and laboratory methods for soil sampling are appropriate and that the data obtained is usable and considered to reasonably represent the concentrations at the sampling points at the time of sampling.

9.0 Results

9.1 Subsurface Conditions

The soils observed during test pitting are summarised below in Table 9.1. The test pit logs are presented in Appendix E.

Table 9.1 – Summary of Geotechnical Units and Soil Types

Soil Type	Description	Depth Range (m bgs)
FILL	Variable materials, predominately Sandy Gravelly CLAY and Sandy Clayey GRAVEL – low to medium plasticity, brown, fine to medium grained gravel in places, fine to medium grained sand, trace weathered rock, root affected in places.	0.0 to 0.1-1.7 (TP02 to TP09)
TOPSOIL	Sandy CLAY - low to medium plasticity, dark brown, fine to medium grained sand, trace fine to coarse grained gravel, sub-angular, root affected.	0.0 to 0.1-0.25
COLLUVIUM/ TOPSOIL	Sandy CLAY – low plasticity, brown, fine grained sand.	0.15 to 0.25
RESIDUAL SOIL	Sandy CLAY– low to medium plasticity, varying colour combinations of orange-brown, red-brown and brown fine grained sand.	0.2–1.7 to 0.8–2.5*

* End of hole

The soils in the surface samples (SS01 to SS50) typically comprised topsoil, sandy clay and sandy gravelly clay, dark brown and brown.

The fill materials observed in the test pits appeared to comprise re-worked site materials which had been excavated and placed as part of levelling portions of the gaol grounds and creating swale drains.

No odours or staining or anthropogenic material was observed during test pitting, with the exception of one fragment of bonded Potential ACM at sample location SS41. The Potential ACM was observed to be approximately 2cm x 5cm in size and was non-weathered in a fair condition. The Potential ACM could not be pulverised by hand pressure.

9.2 PID Results

The soil samples were screened with a Photoionisation Detector (PID) to assess the potential for volatile compounds to be present.

The PID results are included on PID screening sheet included in Appendix E. The PID results ranged from 0.4ppm to 1.5ppm, which indicates a low potential for volatile compounds to be present within the samples.

9.3 Laboratory Results

Soil analytical results are summarised in Table 1 to Table 3, Appendix B. The laboratory analytical reports are also included in Appendix F.

Soil Analytical Results

The soil laboratory results were compared to the investigation levels described in Sections 7.1 and 7.2. The analytical results indicated that concentrations of contaminants were reported below the adopted criteria, with the exception of:

- Zinc reported above the adopted EIL criteria (230mg/kg) in sample SS40 (240mg/kg); and,
- TRHC16-C34 reported above the adopted ESL criteria (300mg/kg) in sample SS27 (320mg/kg).

Asbestos was detected in two samples (see Figure 4), below the adopted guidelines:

- Sample SS2 - Chrysotile asbestos was detected in the form of loose fibre bundles. The asbestos was detected at 0.00022%, which is below the adopted guideline (0.001%); and,
- Sample SS41 - Chrysotile and amosite asbestos was detected in a fragment of ACM. The concentration of asbestos in the sample was calculated to be 0.0041%, which is below the adopted guideline (0.01%).

95% Upper Confidence Limit Calculations

For concentrations of contaminants exceeding the adopted investigation levels the 95% Upper Confidence Limits (UCLs) of the average concentrations for the surface soil samples (test pits and surface sampling) results were calculated using ProUCL in accordance with the procedures discussed in NEPM (2013) Schedule B2 Section 13 and NSW EPA (1995) Sampling Design Guidelines.

NEPM (2013) Schedule B1, Section 3.2.1 states that:

- "At the very least, the maximum and 95%UCL of the arithmetic mean contaminant concentration should be compared to the relevant Tier 1 screening criteria"
- "The implications of localised elevated values (hotspots) should also be considered. The results should also meet the following criteria:
    - The standard deviation of the results should be less than 50% of the relevant investigation or screening level, and

- No single value should exceed 250% of the relevant investigation or screening level."

Calculation sheets for data statistics, including average, standard deviation and 95%UCL of the average, are attached in Appendix G. ProUCL calculates the UCL comparing a number of different methods, including normal distribution, lognormal distribution, gamma distribution and nonparametric. ProUCL then recommends an appropriate method for the data set.

The UCL calculations for zinc and TRH C16-C34 were calculated and showed:

Parameter	Zinc	TRH C16-C34
No. Samples	30	30
Average	50.43	136.3
Standard Deviation	44.11	64.78
95% UCL	64.29mg/kg	157.1mg/kg
EIL/ESL	230mg/kg	320mg/kg

The 95% UCL calculations showed that the arithmetic average of zinc and TRH C16-0C34 was below the adopted EIL/ESL.

Preliminary Waste Classification

The waste classification results are summarised in Table 4.

The laboratory results were compared to the investigation levels described in Section 7.3. The analytical results indicated that concentrations of contaminants were recorded below the CT1 values for General Solid Waste. As asbestos was detected in samples SS2 and SS41, the material in the vicinity of these samples would classify as General Solid Waste (managed as Asbestos Waste).

10.0 Preliminary VENM Assessment

The NSW EPA (2014) Waste Classification Guidelines define *"Virgin excavated natural material means natural material (such as clay, gravel, sand, soil or rock fines):*

- *that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities*
- *that does not contain sulfidic ores or soils, or any other waste.*

And includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette."

The site is located in a semi-rural area of Cessnock, NSW. Prior to construction of the gaol the site was vacant cleared land, and was unlikely to have been developed. Based on the site history assessment (DP, 2016), there is a potential that the site was used for viticulture.

No potentially contaminated soils were observed in the assessed underlying residual and weathered rock material.

Based on the Acid Sulfate Risk Map for the site (Cessnock) the site is within an area of 'No Known Occurrence' of acid sulfate soils.

On the basis of the above observations, the residual soils and weathered rock is classified as VENM, in accordance with the NSW EPA (2014) *Waste Classification Guidelines*. It is noted that the overlying topsoil and fill materials are not included in this VENM assessment. Should any fill or topsoil be mixed with the residual soil or weathered rock, then the VERNM classification would no longer apply.

11.0 Conceptual Site Model

Based on the results of the contamination assessment carried out on the site a conceptual site model (CSM) has been developed.

11.1 Potential Sources of Contamination

Table 11.1 (below) shows the areas of environmental concern (AECs) and associated Chemicals of Potential Concern (COPCs) identified for the site.

Table 11.1 – Potential AECs and COPCs

AEC	Potentially Contaminating Activity	COPCs	Likelihood of Contamination	Sampling Undertaken
1. Fill materials in bunds and fill mounds	Potential importation/use of fill of unknown origin and quality	TRH, BTEX, PAH, OCP, PCB, Metals, Asbestos	Medium	SS1 to SS50 and TP01 to TP10
2. Vicinity of demountable buildings stored in the eastern portion of the site (proposed car park), and the northern portion of the site (proposed 240 Bed Expansion)	Use, demolition and storage of structures containing hazardous building materials and use of heavy machinery to move demountable buildings	Asbestos, Metals, TRH, BTEX, PAH	Low to Medium	SS1 to SS37, SS43 to SS50 and TP01 to TP10
Potential previous viticulture, and weed control.	"Potential application of herbicides and pesticides	OCP, OPP, herbicides, TRH, PAH, Metal	Low	SS1, SS2, SS12, SS27, TP01 to TP10

Notes: Samples taken from 0.0-0.1m in TP01 to TP10

11.2 Potentially Affected Media, Receptors and Exposure Pathways

Table 11.2 summarises the potentially affected media, potential receptors to contamination, and potential and complete exposure pathways.

Table 11.2 – Summary of Potentially Affected Media, Receptors and Exposure Pathways

Consideration	Information
Potentially affected media	Soil Surface water
Potential transport mechanisms & exposure pathways	Direct dermal contact with contaminated soil Inhalation of dust and asbestos fibres Ingestion of contaminated soil (as dust) Leaching of soil contaminants to surface water Surface water discharge to the unnamed creek located 350m south-southeast of the site.
Potential receptors of contamination	***Site occupants & construction/maintenance workers*** Potential exposure via dermal contact with soil and surface water, ingestion of soil, and inhalation of asbestos fibres. Contact with groundwater is considered unlikely, taking into account the anticipated depth to groundwater (>10m bgs in a unconfined or semi-confined aquifer), and that groundwater is not currently extracted on site for beneficial use. ***Surface water*** Contaminants could leach from soils into surface water in the unnamed creek located 350m to the south of the site. Given the distance from the site to the creek, and the presence of stormwater drains in the road corridors between the site and the creek, it is considered unlikely that site contamination would leach into surface water in the unnamed creek. ***Groundwater*** Contaminants could leach from soils into groundwater. This is considered a lower risk as groundwater is expected to be present at depths >10m within a semi confined/confined aquifer. ***Black Creek*** It is considered that groundwater could discharge to Black Creek, located approximately 2.2km to the east of the site. Given the low risk of groundwater to be contaminated as a result of site conditions, the risk of site contamination reaching Black Creek is low.

11.3 Potential and Complete Exposure Pathways

Table 11.3 (below) summarises the potential and complete exposure pathways.

Table 11.3 – Potential and Complete Exposure Pathways

Receptor/Media	Exposure Pathway	Comment
Site occupants	Incomplete	As no contamination was identified, there is no complete exposure pathway for site users.
Construction/maintenance workers	Complete	Asbestos was detected below adopted guidelines in two locations, including Fibrous Asbestos (FA). Disturbance of the FA (i.e. during earthworks) could pose a risk to construction or maintenance workers.
Groundwater users	Incomplete	No contamination was identified on the site, and groundwater is anticipated to be at depths >5m. Therefore, the potential for groundwater to be contaminated is considered to be low, and a complete exposure pathway does not exist.
Surface water ecosystems and users	Incomplete	No contamination was identified on the site, and the nearest surface water body (unnamed creek) is located 350m south of the site. Therefore, it is considered that the potential for surface water to be impacted from the site is low, and a complete exposure pathway does not exist.

12.0 Discussion

The Preliminary Site Investigation (DP 2016), and a review of aerial photographs from 1961 to 2018, identified three Areas of Environmental Concern (AECs), relating to:

- Application of herbicides and pesticides during weed control and associated with the potential former use of the site for viticulture;
- Previous storage of demountable buildings; and
- Use of fill materials.

In order to assess the AECs identified, 60 sampling locations (surface soil samples and test pits) were spread across the site on a 30m grid. The test pits were used to assess the deeper soil profile, particularly in areas where fill was suspected to be present. The fill materials observed in the test pits appeared to comprise re-worked site materials which had been excavated and placed as part of levelling portions of the gaol grounds and creating swale drains.

The laboratory analysis showed concentrations of contaminants below the adopted guidelines for residential land use with access to soil. Asbestos was detected in two locations, with location SS2 showing fibrous asbestos and location SS41 showing bonded ACM. In both locations, the concentration of asbestos was below the adopted guideline.

Groundwater beneath the site is expected to be greater than 10m bgs and given the top down mode of contamination and clay sub soil a complete exposure pathway for contamination to enter the groundwater is not considered to exist. Should the proposed development intercept groundwater then an assessment of groundwater quality beneath the site may be required.

Surface water from the site would be expected to infiltrate into site soils, with excess surface water draining to the south towards an unnamed creek, located 350m south of the site. Based on the distance from the site to the unnamed creek, and that contamination was not identified on the site, it is considered unlikely that the site would impact the creek.

Waste Classification

The topsoil and fill material have been preliminary classified as General Solid Waste (non-putrescible). Due to the presence of asbestos, topsoil and fill material around sample locations SS2 and SS41 would be classified as General Solid Waste (managed as Asbestos Waste). Should the topsoil and fill material require disposal off-site, confirmation of the waste classification would be required.

The residual soils and weathered rock classify as VENM, in accordance with the NSW EPA (2014) *Waste Classification Guidelines*. It is noted that if any topsoil or fill material is mixed with the residual soil and weathered rock, then the VENM classification would no longer apply.

13.0 Conclusions and Recommendations

Based on the results of the assessment the site is suitable for the proposed development. Due to the presence of asbestos in soil in two locations, the following are required:

- Preparation of an Asbestos in Soil Management Plan (ASMP) for use during earthworks and/or when construction or maintenance workers could be in contact with the impacted soil. The ASMP would cover health & safety requirements to protect construction workers, site users and visitors, provide procedures on the placement of the impacted soil, and provide an unexpected finds procedure;
- An asbestos clearance of the top 10cm of soil in the area where the asbestos impacted soils are removed from; and,
- In addition, due to the emotive nature of asbestos contamination, we would recommend placement of it beneath a structure or road pavement, and a survey of the placement location for possible future works.

14.0 Limitations

The findings presented in the report and used as the basis for recommendations presented herein were obtained using normal, industry accepted practices and standards. To our knowledge, they represent a reasonable interpretation of the general conditions of the site.

In compiling this report Qualtest has relied on information contained in reports prepared by others. The accuracy of the information contained within these reports cannot be verified beyond what has been uncovered through this review.

Data and opinions contained within the report may not be used in other contexts or for any other purposes without prior review and agreement by Qualtest. If this report is reproduced, it must be in full.

15.0 References

Douglas Partners Pty Ltd (2016) Report on Preliminary Site Investigation (Contamination) Redevelopment of Cessnock Correctional Centre, ref: 81986.00R.002.Rev0 dated 6 July 2016 (DP, 2016)

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

NEPC (2013) *National Environmental Protection (Assessment of Site Contamination)* Measure 1999, as amended in 2013, National Environment Protection Council (ASC NEPM, 2013).

NSW Department of Primary Industries (Office of Water) Registered Groundwater Bore Map, accessed from http://allwaterdata.water.nsw.gov.au/water.stm, accessed on 6 June 2018.

NSW Land and Property Information, Spatial Information eXchange (SIX) Maps - Topographic Map, accessed from https://maps.six.nsw.gov.au/, accessed on 6 June 2018.

NSW Department of Land and Water Conservation (1997) Cessnock Acid Sulfate Soil Risk Map (1:25,000 scale, Edition Two)

NSW OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites.

NSW EPA (1995) Sampling Design Guidelines

NSW EPA (2014) Waste Classification Guidelines

WA DoH (2009*) Guidelines of the assessment and management of asbestos contaminated sites in Western Australia*, WA Department of Health and Department of Environment and Conservation

APPENDIX A:

Figures

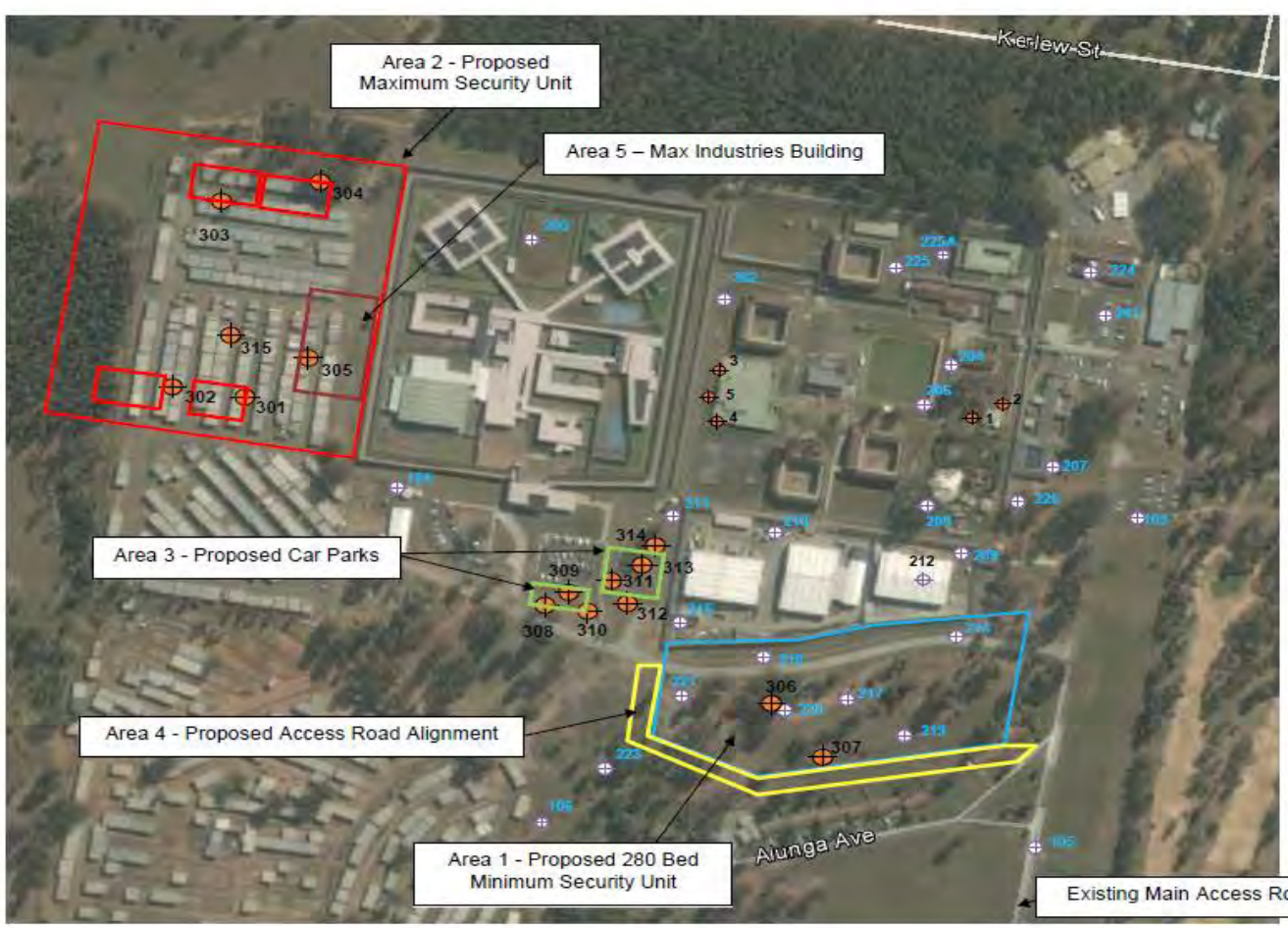
LEGEND:

Approx. location of site

Figure based on image taken from web portal Nearmaps (http://maps.au.nearmap.com/2018).

Qualtest LABORATORY (NSW) PTY LTD

Client:	Lend Lease	Drawing No:	FIGURE 1
Project:	Cessnock Gaol 240 Minimum	Project No:	NEW18P-0117
Location:	Cessnock Gaol, Cessnock	Scale:	N.T.S.
Title:	Site Location	Date:	8/06/2018



Locality of Site

Notes:

1. Drawing adapted from plan provided by the client

0 40 200 400

~ 1:4000 @ A3

Legend:

- Approximate Test Bore Locations (previous investigation)
- Approximate Test Bore Locations (previous investigation)
- Approximate Test Bore Locations (current investigation)

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	NBRS Architecture	TITLE:	Test Location Plan
OFFICE:	Newcastle	DRAWN BY:	MPG
SCALE:	1:4000@A3 (approx.)	DATE:	11.05.2016
			Correctional Facility Upgrade
			Cessnock
PROJECT No:	81986.00		
DRAWING No:	1		
REVISION:	0		

Qualtest LABORATORY (NSW) PTY LTD

Client:	Lend Lease	Drawing No:	FIGURE 2
Project:	Cessnock Gaol 240 Minimum	Project No:	NEW18P-0117
Location:	Cessnock Gaol, Cessnock	Scale:	N.T.S.
Title:	DP (2016a) Figure 1 - showing Areas 1 to 5	Date:	8/06/2018

Client:	Lend Lease	Drawing No:	FIGURE 3
Project:	Cessnock Gaol 240 Minimum	Project No:	NEW18P-0117
Location:	Cessnock Gaol, Cessnock	Scale:	N.T.S.
Title:	Sample Locations on Proposed Development Layout	Date:	14/06/2018

Qualtest LABORATORY (NSW) PTY LTD

Figure based on image taken from Google Earth.

Qualtest LABORATORY (NSW) PTY LTD

Client:	Lend Lease	Drawing No:	FIGURE 4
Project:	Cessnock Gaol 240 Minimum	Project No:	NEW18P-0117
Location:	Cessnock Gaol, Cessnock	Scale:	N.T.S.
Title:	Sample Locations & Asbestos Detected	Date:	14/06/2018

APPENDIX B:

Tables

Lend Lease
NEW18P-0117

Table 1 - Soil Analytical Results - TRH, BTEX, PAH Metals
Cessnock Gaol - 240 Bed Minimum Expansion

						Field ID	SS1	SS2	SS6	SS8	SS10	SS12	SS16	SS18	SS20	SS22	SS24	SS26	SS27	SS30	SS32	SS36	SS37	SS38	SS39	SS40	SS41	SS42	SS44
						Date	8/06/2018	8/06/2018	13/06/2018	13/06/2018	13/06/2018	8/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	8/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018
Analytes		Units	EQL	HIL-A [1]	HSL A&B [2]	EILs/ESLs [3]																							
	pH (1:5 Aqueous extract)	ph units	0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.5	-	-	6.2	-	-	-	-	-
	Cation Exchange Capacity	meq/100g	0.05				-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.4	-	-	6.1	-	-	-	-	-
Heavy Metals	Arsenic	mg/kg	2	100		100	14	4.7	4.2	6	4.7	6.9	4.8	4.5	4.6	4.4	5.7	22	5.8	9.7	12	19	2.4	2.1	3.2	3.8	4.2	3	5.6
	Cadmium	mg/kg	0.4	20			< 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	< 0.4
	Chromium	mg/kg	5	100		400*	27	24	8.7	16	9.2	23	10	21	10	8.6	14	52	14	17	24	29	8.6	12	18	14	21	16	14
	Copper	mg/kg	5	6000		190*	< 5	18	< 5	< 5	< 5	7.6	< 5	8.4	< 5	< 5	< 5	< 5	5.1	20	< 5	5.5	5.5	8.7	12	16	12	8.3	7.3
	Lead	mg/kg	5	300		1100	11	35	14	12	13	13	14	7.4	13	10	15	19	15	23	16	22	9.1	6.3	9.1	17	9.6	7.2	27
	Mercury	mg/kg	5	40			< 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
	Nickel	mg/kg	5	400		30*	< 5	19	< 5	7.1	< 5	13	< 5	18	< 5	5.8	5.8	6.4	7.6	8.5	6.6	8.3	< 5	9.9	14	9.6	19	13	10
	Zinc	mg/kg	5	7400		230*	10	97	32	21	25	47	35	38	22	13	31	48	73	110	31	48	48	59	96	240	67	64	57
PAHs	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
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene TEQ (medium bound)	mg/kg	0.6	3			0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	< 0.5	< 0.5	< 0.5
	Fluorene	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
	Indeno(1.2.3-cd)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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5			170	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	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
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5	< 0.5	< 0.5
	Total PAH	mg/kg	0.5	300			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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
BTEX	Benzene	mg/kg	0.1		0.5	50	< 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
	Toluene	mg/kg	0.1		160	85	< 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
	Ethylbenzene	mg/kg	0.1		55	70	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3		40	105	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
TRH	Naphthalene	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
	TRH C6-C10	mg/kg	20				< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 less BTEX (F1)	mg/kg	20		45	180	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH >C10-C16	mg/kg	50			120	< 50	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	75	67	< 50	78	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50		110		< 50	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	75	67	< 50	78	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C16-C34	mg/kg	100			300	< 100	230	< 100	< 100	< 100	110	260	< 100	120	< 100	150	< 100	320	280	< 100	270	120	< 100	< 100	< 100	140	< 100	160
	TRH >C34-C40	mg/kg	100			2800	< 100	340	< 100	< 100	< 100	330	120	< 100	< 100	< 100	< 100	< 100	510	< 100	< 100	< 100	< 100	< 100	< 100	150	< 100	< 100	< 100

Notes

*	Based on an average pH of 6.0, a CEC of 7.8 meq/100g and clay content of >10%.
ND	Not detected
NL	Not limiting
Result	Concentration exceeds adopted human health critieria
Result	Concentration exceeds adopted health screening level, vapour intrusion (Residential) -Sand 0-1m
Result	Concentration exceeds adopted ecological investigation and screening levels, (residential) - sand 0-1m

1 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investigation Levels
2 NEPC (2013) Soil Health Screening Levels for Vapour Intrusion, Residential, Sand 0m to <1m
3 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Ecological Investigation and Screening Levels

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Table 1 - Soil Analytical Results - TRH, BTEX, PAH Metals
Cessnock Gaol - 240 Bed Minimum Expansion

Qualtest LABORATORY (NSW) PTY LTD

						Field ID	SS46	SS48	SS50	TP1 0.0-0.1	TP4 0.0-0.2	TP8 0.0-0.2	TP10 0.0-0.2
						Date	15/06/2018	15/06/2018	15/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018
Analytes		Units	EQL	HIL-A[1]	HSL A&B[2]	EILs/ESLs[3]							
	pH (1:5 Aqueous extract)	ph units	0.1				6.5	-	-	-	-	-	-
	Cation Exchange Capacity	meq/100g	0.05				11	-	-	-	-	-	-
Heavy Metals	Arsenic	mg/kg	2	100		100	9.4	6.7	3.7	4.5	14	3.7	17
	Cadmium	mg/kg	0.4	20			< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium	mg/kg	5	100		400*	18	17	11	14	32	9.1	35
	Copper	mg/kg	5	6000		190*	< 5	6.1	< 5	< 5	< 5	< 5	< 5
	Lead	mg/kg	5	300		1100	11	11	8.7	8.2	15	8	18
	Mercury	mg/kg	5	40			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Nickel	mg/kg	5	400		30*	7.8	9.8	6.3	5.8	< 5	< 5	8.9
	Zinc	mg/kg	5	7400		230*	34	60	27	15	17	19	29
PAHs	Acenaphthene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benz(a)anthracene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5			0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene TEQ (medium bound)	mg/kg	0.6	3			0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Benzo(b&j)fluoranthene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(g.h.i)perylene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenz(a.h)anthracene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5			170	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Pyrene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH	mg/kg	0.5	300			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BTEX	Benzene	mg/kg	0.1		0.5	50	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1		160	85	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1		55	70	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3		40	105	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
TRH	Naphthalene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	TRH C6-C10	mg/kg	20				< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 less BTEX (F1)	mg/kg	20		45	180	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH >C10-C16	mg/kg	50			120	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50		110		< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C16-C34	mg/kg	100			300	< 100	< 100	120	110	< 100	< 100	< 100
	TRH >C34-C40	mg/kg	100			2800	< 100	< 100	330	< 100	< 100	< 100	< 100

Notes

*	Based on an average pH of 6.0, a CEC of 7.8 meq/100g and clay content of >10%.
ND	Not detected
NL	Not limiting
Result	Concentration exceeds adopted human health critieria
Result	Concentration exceeds adopted health screening level, vapour intrusion (Residential) -Sand 0-1m
Result	Concentration exceeds adopted ecological investigation and screening levels, (residential) - sand 0-1m
1	NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Tabl
2	NEPC (2013) Soil Health Screening Levels for Vapour Intrusion, Residential, Sand 0m to <1m
3	NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Ecol

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Table 2 - Soil Analytical Results - OCP, OPP, PCB Herbicides
Cessnock Gaol - 240 Bed Minimum Expansion

Qualtest LABORATORY (NSW) PTY LTD

						Field ID	SS1	SS2	SS12	SS27	TP1 0.0-0.1	TP2 0.0-0.2	TP3 0.0-0.1	TP4 0.0-0.2	TP5 0.0-0.2	TP6 0.0-0.2	TP7 0.0-0.2	TP8 0.0-0.2	TP9 0.0-0.2	TP10 0.0-0.2
						Date	8/06/2018	8/06/2018	8/06/2018	8/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018
Analytes		Units	EQL	HIL-A[1]	HSL A&B[2]	EILs/ESLs[3]														
OCPs	4.4'-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
	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
	4.4'-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
	DDE, DDT, DDD	mg/kg	0.15	240			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	a-BHC	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Aldrin and Dieldrin	mg/kg	0.10	6			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Aldrin	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	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
	Chlordanes - Total	mg/kg	0.10	50			< 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
	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
	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
	Endosulfan I	mg/kg	0.05	270			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Endosulfan II	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	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
	Endrin	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
	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
	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
	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
	Heptachlor	mg/kg	0.05	6			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Heptachlor epoxide	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Hexachlorobenzene	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Methoxychlor	mg/kg	0.05	300			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Toxaphene	mg/kg	1.00	20			< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPPs	Azinphos-methyl	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
	Bolstar	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
	Chlorfenvinphos	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
	Chlorpyrifos	mg/kg	0.2	160			< 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
	Chlorpyrifos-methyl	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
	Coumaphos	mg/kg	2				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Demeton-O	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
	Demeton-S	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
	Diazinon	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
	Dichlorvos	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
	Dimethoate	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
	Disulfoton	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
	EPN	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
	Ethion	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
	Ethoprop	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
	Ethyl parathion	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
	Fenitrothion	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
	Fensulfothion	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
	Fenthion	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
	Malathion	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
	Merphos	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
	Methyl parathion	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
	Mevinphos	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
	Monocrotophos	mg/kg	2				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Naled	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
	Omethoate	mg/kg	2				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
	Phorate	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
	Pirimiphos-methyl	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
	Pyrazophos	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
	Ronnel	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
	Terbufos	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
	Tetrachlorvinphos	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
	Tokuthion	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
	Trichloronate	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
Herbicides	2.4.5-T	mg/kg	0.5	600			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	2.4.5-TP	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
	2.4-D	mg/kg	0.5	900			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	2.4-DB	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
	Actril (loxynil)	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
	Dicamba	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
	Dichlorprop	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
	Dinitro-o-cresol	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
	Dinoseb	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
	MCPA	mg/kg	0.5	600			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	MCPB	mg/kg	0.5	600			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Mecoprop	mg/kg	0.5	600			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
PCBs	Aroclor-1016	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
	Aroclor-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
	Aroclor-1232	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
	Aroclor-1242	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
	Aroclor-1248	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
	Aroclor-1254	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
	Aroclor-1260	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
	Total PCB*	mg/kg	0.1	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

Notes

*	Based on an average pH of 6.5, a CEC of 9 meq/100g and clay content of >10%.
ND	Not detected
NL	Not limiting
Result	Concentration exceeds adopted human health critieria
Result	Concentration exceeds adopted health screening level, vapour intrusion (Residential) -Sand 0-1m
Result	Concentration exceeds adopted ecological investigation and screening levels, (residential) - sand 0-1m

1 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investigation Levels
2 NEPC (2013) Soil Health Screening Levels for Vapour Intrusion, Residential, Sand 0m to <1m
3 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Ecological Investigation and Screening Levels

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Table 3 - Asbestos Analytical Results
Cessnock Gaol - 240 Bed Minimum Expansion

Qualtest LABORATORY (NSW) PTY LTD

				Field ID	SS1	SS2	SS3	SS4	SS5	SS6	SS7	SS8	SS9	SS10
				Date	8/06/2018	8/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018
Analytes		Units	EQL	HIL-A [1]										
Asbestos	Bonded ACM Fragments	g	0.00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Bonded ACM	%	0.001	0.01	<0.001	<0.001%	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	FA*/AF**	%	0.001	0.001	<0.001	0.00022%	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

				Field ID	SS11	SS12	SS13	SS14	SS15	SS16	SS17	SS18	SS19	SS20
				Date	13/06/2018	8/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018
Analytes		Units	EQL	HIL-A [1]										
Asbestos	Bonded ACM Fragments	g	0.00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Bonded ACM	%	0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	FA*/AF**	%	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

				Field ID	SS21	SS22	SS23	SS24	SS25	SS26	SS27	SS28	SS29	SS30
				Date	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	8/06/2018	13/06/2018	13/06/2018	15/06/2018
Analytes		Units	EQL	HIL-A [1]										
Asbestos	Bonded ACM Fragments	g	0.00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Bonded ACM	%	0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	FA*/AF**	%	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

				Field ID	SS31	SS32	SS33	SS34	SS35	SS36	SS37	SS38	SS39	SS40
				Date	15/06/2018	15/06/2018	13/06/2018	14/0602018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018
Analytes		Units	EQL	HIL-A [1]										
Asbestos	Bonded ACM Fragments	g	0.00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Bonded ACM	%	0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	FA*/AF**	%	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

				Field ID	SS41	SS42	SS43	SS44	SS45	SS46	SS47	SS48	SS49	SS50
				Date	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018
Analytes		Units	EQL	HIL-A [1]										
Asbestos	Bonded ACM Fragments	g	0.00		3.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Bonded ACM	%	0.001	0.01	<0.0041%	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	FA*/AF**	%	0.001	0.001	<0.001%	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

				Field ID	TP1 0.0-0.1	TP2 0.0-0.2	TP3 0.0-0.1	TP4 0.0-0.2	TP5 0.0-0.2	TP6 0.0-0.2	TP7 0.0-0.2	TP8 0.0-0.2	TP9 0.0-0.2	TP10 0.0-0.2
				Date	14/0602018	14/0602018	14/0602018	14/0602018	14/0602018	14/0602018	14/0602018	14/0602018	14/0602018	14/0602018
Analytes		Units	EQL	HIL-A [1]										
Asbestos	Bonded ACM Fragments	g	0.00		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Bonded ACM	%	0.001	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	FA*/AF**	%	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes

ND Not detected RED Sample contains asbestos Result Sample exceeds adopted guidelines

1 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Table 1A(1): Health Investigation Levels

* Fibrous asbestos (FA) - friable asbestos material, such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

** Asbestos fines (AF) - includes free fibres of asbestos, small fibre bundles and also ACM fragments that pass through a 7mm x 7mm sieve.

^ Density of soil (1.0kg/L) based on results of weighing samples

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Table 4 - Waste Classification Results, TRH, BTEX, PAH, Metals
Cessnock Gaol - 240 Bed Minimum Expansion

				Field ID	SS1	SS2	SS6	SS8	SS10	SS12	SS16	SS18	SS20	SS22	SS24	SS26	SS27	SS30	SS32	SS36	SS37	SS38	SS39	SS40	SS41	SS42	SS44	SS46
				Date	8/06/2018	8/06/2018	13/06/2018	13/06/2018	13/06/2018	8/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	13/06/2018	8/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018	15/06/2018
Analytes		Units	EQL	General Solid Waste (CT1)																								
Heavy Metals	Arsenic	mg/kg	2	100	14	4.7	4.2	6	4.7	6.9	4.8	4.5	4.6	4.4	5.7	22	5.8	9.7	12	19	2.4	2.1	3.2	3.8	4.2	3	5.6	9.4
	Cadmium	mg/kg	0.4	20	< 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	< 0.4	< 0.4
	Chromium	mg/kg	5	100	27	24	8.7	16	9.2	23	10	21	10	8.6	14	52	14	17	24	29	8.6	12	18	14	21	16	14	18
	Copper	mg/kg	5		< 5	18	< 5	< 5	< 5	7.6	< 5	8.4	< 5	< 5	< 5	< 5	5.1	20	< 5	5.5	5.5	8.7	12	16	12	8.3	7.3	< 5
	Lead	mg/kg	5	100	11	35	14	12	13	13	14	7.4	13	10	15	19	15	23	16	22	9.1	6.3	9.1	17	9.6	7.2	27	11
	Mercury	mg/kg	5	4	< 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
	Nickel	mg/kg	5	40	< 5	19	< 5	7.1	< 5	13	< 5	18	< 5	5.8	5.8	6.4	7.6	8.5	6.6	8.3	< 5	9.9	14	9.6	19	13	10	7.8
	Zinc	mg/kg	5		10	97	32	21	25	47	35	38	22	13	31	48	73	110	31	48	48	59	96	240	67	64	57	34
PAHs	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
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	0.8	< 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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	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
	Indeno(1.2.3-cd)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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	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
	Phenanthrene	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
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	1	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH	mg/kg	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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
BTEX	Benzene	mg/kg	0.1	10	< 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
	Toluene	mg/kg	0.1	288	< 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
	Ethylbenzene	mg/kg	0.1	600	< 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
	Xylenes - Total	mg/kg	0.3	1000	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
TRH	TRH C6-C9	mg/kg	20	650	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C10-C14	mg/kg	20		< 20	71	< 20	< 20	< 20	21	< 20	< 20	< 20	< 20	< 20	< 20	50	64	46	82	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C15-C28	mg/kg	50		< 50	180	< 50	< 50	< 50	92	160	53	60	< 50	92	60	240	250	89	240	< 50	51	73	< 50	95	60	120	< 50
	TRH C29-C36	mg/kg	50		< 50	140	55	< 50	< 50	88	190	76	97	51	110	91	200	170	57	160	100	55	63	140	99	61	110	< 50
	TRH C10-36 (Total)	mg/kg	50	10000	< 50	391	55	< 50	< 50	201	350	129	157	51	202	151	490	484	192	482	100	106	136	140	194	121	230	< 50

Notes
ND Not detected
Result Concentration exceeds General Solid Waste criteria
1 NSW EPA (2014) Waste Classification Guidelines, CT1 criteria

Lend Lease
NEW18P-0117

Table 4 - Waste Classification Results, TRH, BTEX, PAH, Metals
Cessnock Gaol - 240 Bed Minimum Expansion

				Field ID	SS48	SS50	TP1 0.0-0.1	TP4 0.0-0.2	TP8 0.0-0.2	TP10 0.0-0.2
				Date	15/06/2018	15/06/2018	14/06/2018	14/06/2018	14/06/2018	14/06/2018
Analytes		Units	EQL	General Solid Waste (CT1)						
Heavy Metals	Arsenic	mg/kg	2	100	6.7	3.7	4.5	14	3.7	17
	Cadmium	mg/kg	0.4	20	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium	mg/kg	5	100	17	11	14	32	9.1	35
	Copper	mg/kg	5		6.1	< 5	< 5	< 5	< 5	< 5
	Lead	mg/kg	5	100	11	8.7	8.2	15	8	18
	Mercury	mg/kg	5	4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Nickel	mg/kg	5	40	9.8	6.3	5.8	< 5	< 5	8.9
	Zinc	mg/kg	5		60	27	15	17	19	29
PAHs	Acenaphthene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benz(a)anthracene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(b&j)fluoranthene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(g.h.i)perylene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenz(a.h)anthracene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Pyrene	mg/kg	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH	mg/kg	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BTEX	Benzene	mg/kg	0.1	10	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1	288	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1	600	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3	1000	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
TRH	TRH C6-C9	mg/kg	20	650	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C10-C14	mg/kg	20		< 20	< 20	< 20	< 20	< 20	< 20
	TRH C15-C28	mg/kg	50		63	83	94	< 50	< 50	< 50
	TRH C29-C36	mg/kg	50		100	310	72	< 50	< 50	< 50
	TRH C10-36 (Total)	mg/kg	50	10000	163	393	166	< 50	< 50	< 50

Notes
ND Not detected
Result Concentration exceeds General Solid Waste criteria
1 NSW EPA (2014) Waste Classification Guidelines, CT1 criteria

Table 5 - QC Results - Duplicates
Cessnock Gaol - Proposed 240 Bed Minimum Expansion

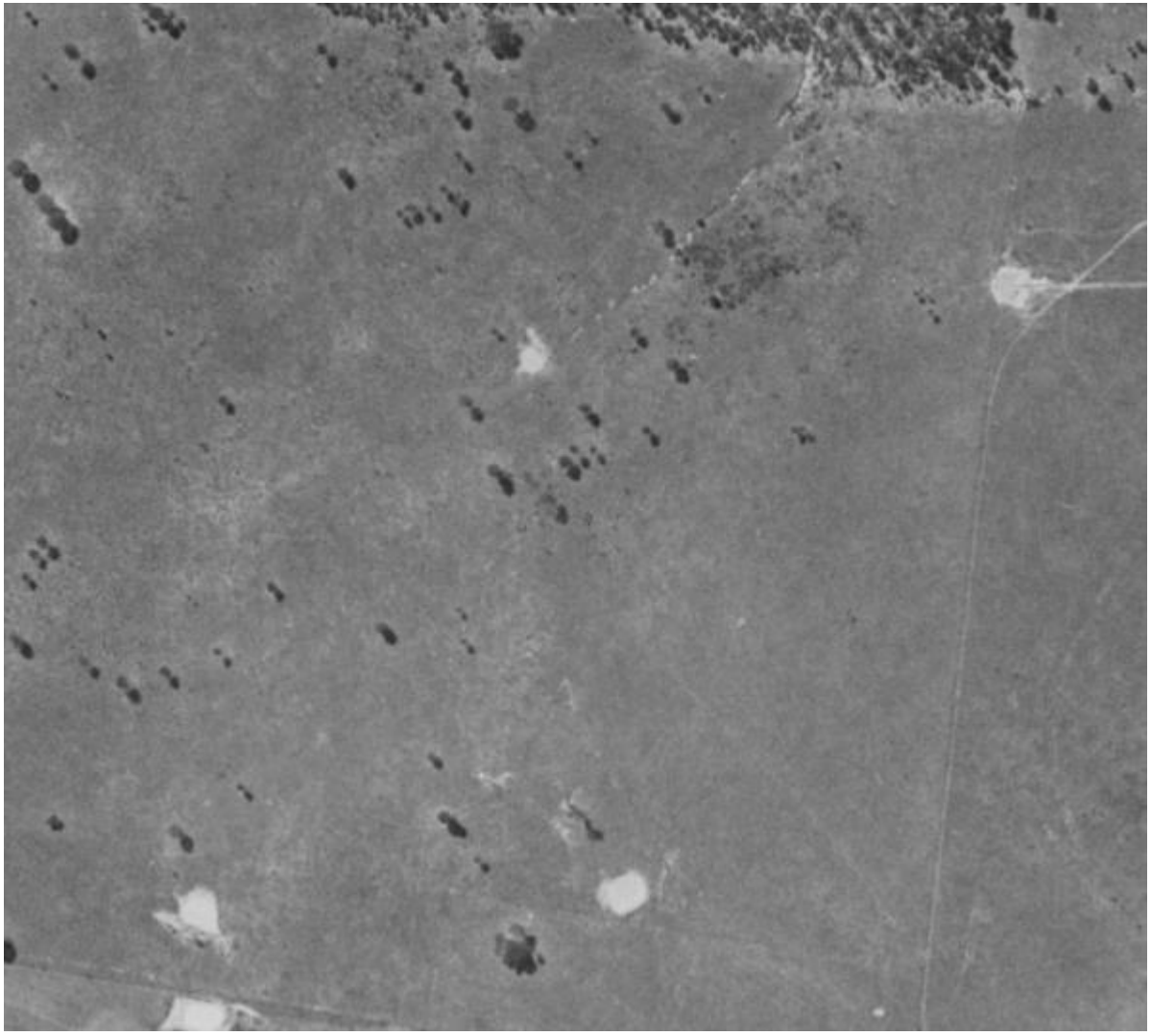
			Field ID	SS1	QC1	RPD %	TP1 0.0-0.1	QC6	RPD %	TP1 0.0-0.1	QC7	RPD %
			Date	8/06/2018	8/06/2018		14/06/2018	14/06/2018		14/08/2016	14/08/2016	
			Comments	Duplicate			Duplicate			Triplicate		
Analytes		Units	EQL									
Heavy Metals	Arsenic	mg/kg	2	14	19	30	4.5	4.9	9	4.5	8	56
	Cadmium	mg/kg	0.4	< 0.4	< 0.4	NA	< 0.4	< 0.4	NA	< 0.4	<1	NA
	Chromium	mg/kg	5	27	28	4	14	16	13	14	19	30
	Copper	mg/kg	5	< 5	< 5	NA	< 5	< 5	NA	< 5	<5	NA
	Lead	mg/kg	5	11	14	24	8.2	9.4	14	8.2	9	9
	Mercury	mg/kg	5	< 0.1	< 0.1	NA	< 0.1	< 0.1	NA	< 0.1	<0.1	NA
	Nickel	mg/kg	5	< 5	7.2	NA	5.8	5.8	0	5.8	7	19
	Zinc	mg/kg	5	10	22	75	15	14	7	15	16	6
PAHs	Acenaphthene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Acenaphthylene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Anthracene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Benz(a)anthracene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Benzo(a)pyrene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.6	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0
	Benzo(b&j)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Benzo(g.h.i)perylene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Benzo(k)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Chrysene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Dibenz(a.h)anthracene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Fluoranthene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Fluorene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Naphthalene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Phenanthrene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Pyrene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
	Total PAH*	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA
BTEX	Benzene	mg/kg	0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	NA	< 0.1	<0.2	NA
	Toluene	mg/kg	0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	NA	< 0.1	<0.5	NA
	Ethylbenzene	mg/kg	0.1	< 0.1	< 0.1	NA	< 0.1	< 0.1	NA	< 0.1	<0.5	NA
	Xylenes - Total	mg/kg	0.3	< 0.3	< 0.3	NA	< 0.3	< 0.3	NA	< 0.3	<0.5	NA
TRH	Naphthalene	mg/kg	0.5	< 0.5	< 0.5	NA	< 0.5	< 0.5	NA	< 0.5	<1	NA
	TRH C6-C10	mg/kg	20	< 20	< 20	NA	< 20	< 20	NA	< 20	<10	NA
	TRH C6-C10 less BTEX (F1)	mg/kg	20	< 20	< 20	NA	< 20	< 20	NA	< 20	<10	NA
	TRH >C10-C16	mg/kg	50	< 50	< 50	NA	< 50	< 50	NA	< 50	<50	NA
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	< 50	< 50	NA	< 50	< 50	NA	< 50	<50	NA
	TRH >C16-C34	mg/kg	100	< 100	< 100	NA	110	< 100	NC	110	<100	NC
	TRH >C34-C40	mg/kg	100	< 100	< 100	NA	< 100	< 100	NA	< 100	<100	NA
	4.4'-DDD	mg/kg	0.05	< 0.05	< 0.05	NA	-	-	-	-	-	-
	4.4'-DDE	mg/kg	0.05	< 0.05	< 0.05	NA	-	-	-	-	-	-

Table 6 - QC Results - Blanks
Cessnock Gaol - Proposed 240 Bed Minimum Expansion

			Field ID	QC2	QC3	QC8
			Date	8/06/2018	8/06/2018	14/06/2018
			Comments	Rinsate	Trip Blank	Trip Blank
Analytes		Units	EQL			
Heavy Metals	Arsenic	mg/kg	0.001	< 0.001	-	-
	Cadmium	mg/kg	0.0002	< 0.0002	-	-
	Chromium	mg/kg	0.001	< 0.001	-	-
	Copper	mg/kg	0.001	< 0.001	-	-
	Lead	mg/kg	0.001	< 0.001	-	-
	Mercury	mg/kg	0.0001	< 0.0001	-	-
	Nickel	mg/kg	0.001	< 0.001	-	-
	Zinc	mg/kg	0.005	< 0.005	-	-
PAHs	Acenaphthene	mg/kg	0.001	< 0.001	-	-
	Acenaphthylene	mg/kg	0.001	< 0.001	-	-
	Anthracene	mg/kg	0.001	< 0.001	-	-
	Benz(a)anthracene	mg/kg	0.001	< 0.001	-	-
	Benzo(a)pyrene	mg/kg	0.001	< 0.001	-	-
	Benzo(b&j)fluoranthene	mg/kg	0.001	< 0.001	-	-
	Benzo(g.h.i)perylene	mg/kg	0.001	< 0.001	-	-
	Benzo(k)fluoranthene	mg/kg	0.001	< 0.001	-	-
	Chrysene	mg/kg	0.001	< 0.001	-	-
	Dibenz(a.h)anthracene	mg/kg	0.001	< 0.001	-	-
	Fluoranthene	mg/kg	0.001	< 0.001	-	-
	Fluorene	mg/kg	0.001	< 0.001	-	-
	Indeno(1.2.3-cd)pyrene	mg/kg	0.001	< 0.001	-	-
	Naphthalene	mg/kg	0.001	< 0.001	-	-
	Phenanthrene	mg/kg	0.001	< 0.001	-	-
	Pyrene	mg/kg	0.001	< 0.001	-	-
	Total PAH*	mg/kg	0.001	< 0.001	-	-
BTEX	Benzene	mg/kg	0.001	< 0.001	< 0.001	< 0.001
	Toluene	mg/kg	0.001	< 0.001	< 0.001	< 0.001
	Ethylbenzene	mg/kg	0.001	< 0.001	< 0.001	< 0.001
	Xylenes - Total	mg/kg	0.003	< 0.003	< 0.003	< 0.003
TRH	Naphthalene	mg/kg	0.01	< 0.01	-	-
	TRH C6-C10	mg/kg	0.02	< 0.02	-	-
	TRH C6-C10 less BTEX (F1)	mg/kg	0.02	< 0.02	-	-
	TRH >C10-C16	mg/kg	0.05	< 0.05	-	-
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	0.05	< 0.05	-	-
	TRH >C16-C34	mg/kg	0.1	< 0.1	-	-
	TRH >C34-C40	mg/kg	0.1	< 0.1	-	-
	4.4'-DDD	mg/kg	0.0001	< 0.0001	-	-
	4.4'-DDE	mg/kg	0.0001	< 0.0001	-	-

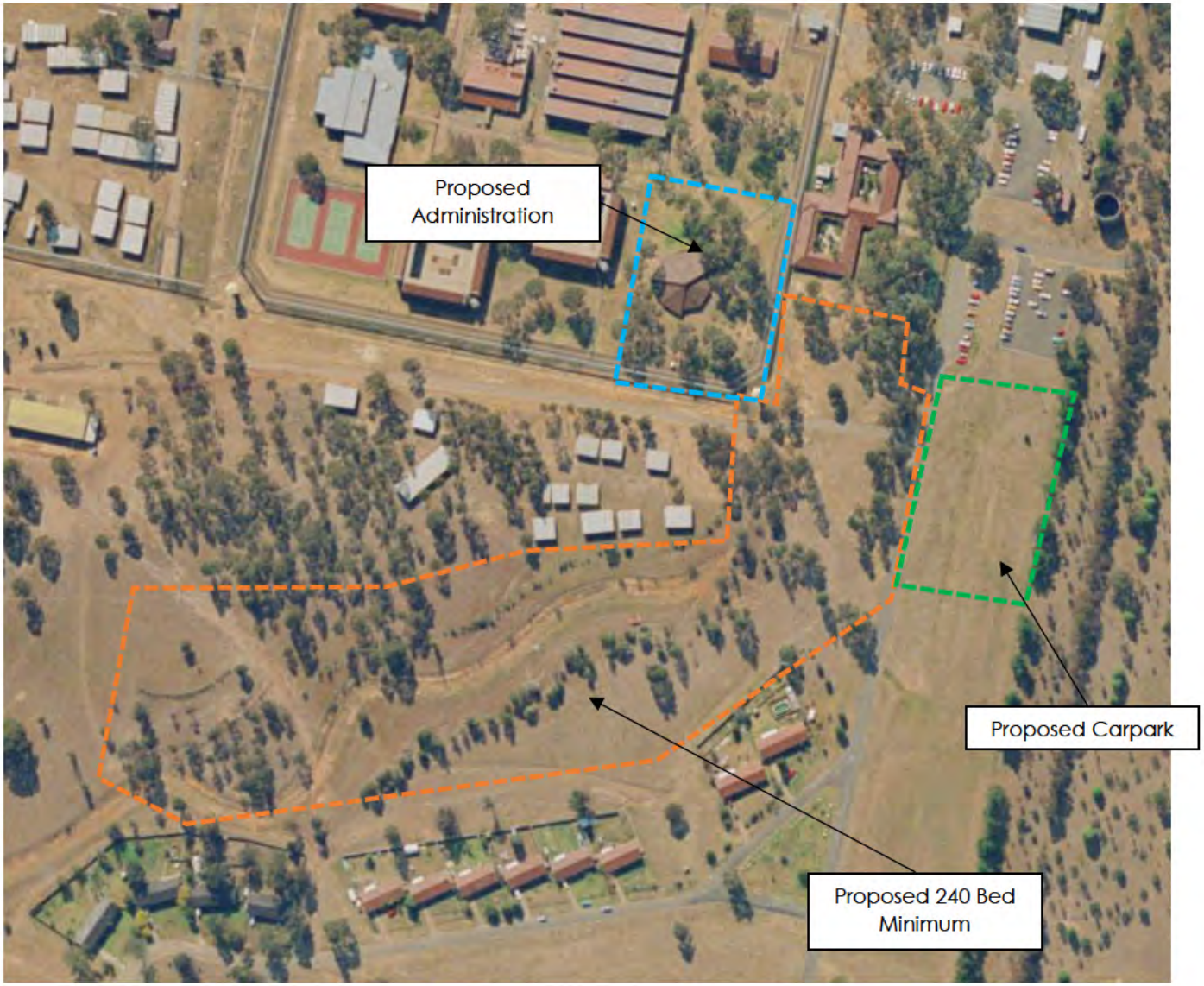
APPENDIX C:

Aerial Photograph Review



1961 – the gaol has not been constructed and the site is cleared vacant land.

1976 – showing the site has been undeveloped. There is a small structure on the southeast corner of the administration area, it is not clear what the structure is.

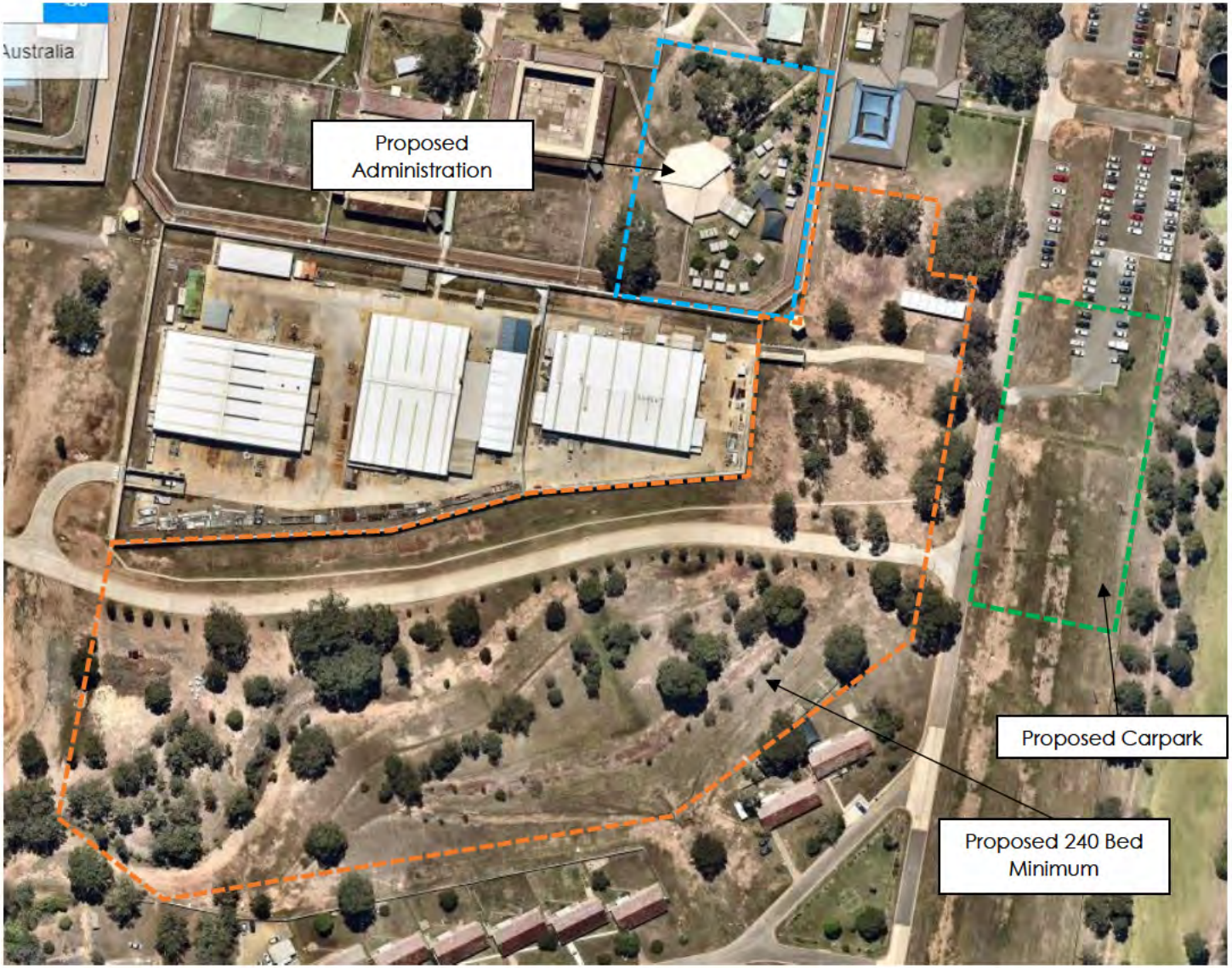


1994 – Showing that the site has largely been undeveloped, with the exception of the roughly circular building in the administration area, and a track or swale drain in the 240-bed area.

19 Jun 2010 – showing large buildings to the west of the site being constructed. Remainder of site appears similar to today. The roof of the circular shaped building in the northern portion of the site appears to be brown tiles.

29 Sep 2014 – The roof of the circular shaped building in the northern portion of the site appears to have been replaced with metal sheeting (i.e. Colorbond). The remainder of the site appears similar to today.

9 Jan 2017 – showing demountable buildings being stored on proposed car park area. Remainder of site appears similar to today.



28 Feb 2018 – showing scarring from demountable buildings being stored on proposed car park area.

APPENDIX D:

Groundwater Bore Search

WaterNSW
Work Summary

GW200249

Licence: 20BL168525 **Licence Status:** ACTIVE

Authorised Purpose(s): TEST BORE
Intended Purpose(s): TEST BORE

Work Type: Bore
Work Status: Filled
Construct.Method: Rotary - Percussion (Down Hole Hammer)
Owner Type:

Commenced Date:
Completion Date: 06/12/2002
Final Depth: 18.00 m
Drilled Depth: 18.00 m

Contractor Name: Slade Drilling
Driller: Paul Edwin Slade
Assistant Driller:

Property: N/A OAKEY CREEK ROAD POKOLBIN 2320
GWMA: -
GW Zone: -
Standing Water Level:
Salinity:
Yield: 1.200

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.49	1/270158
Licensed:	NORTHUMBERLAND	POKOLBIN	Whole Lot 1//270158

Region: 20 - Hunter
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6367023.0
Easting: 343249.0
Latitude: 32°49'25.1"S
Longitude: 151°19'31.6"E

GS Map: -
MGA Zone: 0
Coordinate Source: Map Interpretation

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	18.00	150			Rotary - Percussion (Down Hole Hammer)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
16.00	18.00	2.00	Unknown			1.20			

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	Topsoil	Topsoil	
0.40	6.00	5.60	clay	Clay	
6.00	18.00	12.00	silt	Silt	

Remarks

06/12/2002: Form A Remarks:
When getting the coordinates for the bore on this property, there were none provided so a rough estimate was taken according to a map view of the property. There was no room in the form to say that this bore was backfilled with drilled cuttings from depth 1 to 18m and sealed with concrete from 0 to 1m.

***** End of GW200249 *****

APPENDIX E:

Test Pit Logs

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP01

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.10m				CL-Cl	TOPSOIL: Sandy CLAY - Low to medium plasticity, brown, wi h fine grained sand.	D to M				TOPSOIL
							0.15m					
						CL	Sandy CLAY - Low plas icity, brown, fine grained sand.					COLLUVIUM
							0.25m					
		0.40m					Sandy CLAY - Low plas icity, red-brown and brown, fine grained sand.					RESIDUAL SOIL
		E 0.50m		0.5		CL		D				
							0.75m					
							Hole Terminated at 0.75 m Due to limit of required inves igation					
				1.0								
				1.5								
				2.0								
				2.5								

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP02

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m				CL	0.10m TOPSOIL: Sandy CLAY - Low plasticity, dark brown, fine grained sand, root affected.	D to M				TOPSOIL
		0.40m E 0.50m		0.5		CL	FILL: Sandy Gravelly CLAY - Low plas icity, large pieces of fine grained weathered rock.	D to M				FILL
							0.60m Sandy CLAY - Low plas icity, red-brown, fine grained sand, trace fine grained weathered rock.					RESIDUAL SOIL
		0.90m E 1.00m		1.0		CL	1.20m	D				
				1.5			Hole Terminated at 1.20 m Due to limit of required inves igation					
				2.0								
				2.5								

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP03

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m 0.90m E 1.00m 1.50m E 1.60m 2.00m E 2.10m		0.5 1.0 1.5 2.0		CL-CI	FILL: Sandy Gravelly CLAY - Low to medium plasticity, brown, angular to rounded gravels, cobbles to boulders.	D				FILL
							1.70m Sandy CLAY - Low plas icity, brown and red-brown, fine grained sand.					RESIDUAL SOIL
						CL	2.30m Hole Terminated at 2.30 m Due to limit of required inves igation					
				2.5								

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP04

CLIENT: LEND LEASE | **PAGE:** 1 OF 1

PROJECT: MINIMUM 240 EXPANSION | **JOB NO:** NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW | **LOGGED BY:** SR | **DATE:** 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR | **SURFACE RL:**

TEST PIT LENGTH: 2.0 m | **WIDTH:** 0.6 m | **DATUM:** AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m 0.90m E 1.00m 1.30m E 1.40m		0.5 1.0 1.5 2.0 2.5		CL CL	FILL: Sandy Gravelly CLAY - Low plas icity, brown and red-brown, angular to rounded gravel, fine grained sand. 0.70m Sandy CLAY - Low plas icity, red-brown and orange-brown, fine grained sand, trace fine grained weather rock. 1.40m Hole Terminated at 1.40 m Due to limit of required inves igation	D				FILL RESIDUAL SOIL

LEGEND

Water

- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes

- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density		
V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition	
D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP05

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m 0.90m E 1.00m 1.40m E 1.50m 1.90m E 2.00m 2.30m E 2.40m		0.5 1.0 1.5 2.0 2.5		CL-CI CL	FILL: Sandy Gravelly CLAY - Low to medium plasticity, brown, angular to rounded gravels, fine grained sand, root affected. 1.70m Sandy CLAY - Low plas icity, brown and red-brown, fine grained sand. 2.50m Hole Terminated at 2.50 m Due to limit of required inves igation	D				FILL RESIDUAL SOIL

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP06

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m		0.5		CL CL-CI	FILL: Sandy CLAY - Low plas icity, dark brown, fine grained sand, root affected. 0.20m Sandy CLAY - Low to medium plas icity, red-brown and orange-brown, fine grained sand. 0.80m	D to M				FILL RESIDUAL SOIL
				1.0 1.5 2.0 2.5			Hole Terminated at 0.80 m Due to limit of required inves igation					

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

CLIENT:	LEND LEASE	**TEST PIT NO:**	**TP07**
PROJECT:	MINIMUM 240 EXPANSION	**PAGE:**	1 OF 1
LOCATION:	CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW	**JOB NO:**	NEW18P-0117
		LOGGED BY:	SR
		DATE:	14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR **SURFACE RL:**
TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m **DATUM:** AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m				CL	FILL: Sandy Gravelly CLAY - Low plas icity, brown and orange-brown, fine grained sand, angular to rounded gravel.					FILL
		0.40m					0.20m					
		E 0.50m		0.5		CL	FILL: Sandy Gravelly CLAY - Low plas icity, brown, fine grained sand, angular to rounded gravel, root affected.	D				
							0.70m					RESIDUAL SOIL
		1.00m		1.0		CL-CI	Sandy CLAY - Low to medium plas icity, red-brown and orange-brown, fine grained sand, trace fine grained weathered rock.					
		E 1.10m					1.20m					
				1.5			Hole Terminated at 1.20 m Due to limit of required inves igation					
				2.0								
				2.5								

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP08

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m 0.90m E 1.00m 1.40m E 1.50m		0.5 1.0 1.5 2.0 2.5		CL-CI CL	FILL: Sandy Gravelly CLAY - Low to medium plasticity, orange-brown, fine grained sand, rounded to sub-angular gravel. 1.30m Sandy CLAY - Low plas icity, red-brown and orange-brown, fine grained sand. 1.80m Hole Terminated at 1.80 m Due to limit of required inves igation	D				FILL RESIDUAL SOIL

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP09

CLIENT: LEND LEASE | **PAGE:** 1 OF 1

PROJECT: MINIMUM 240 EXPANSION | **JOB NO:** NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW | **LOGGED BY:** SR | **DATE:** 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR | **SURFACE RL:**

TEST PIT LENGTH: 2.0 m | **WIDTH:** 0.6 m | **DATUM:** AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m 0.90m E 1.00m		0.5 1.0 1.5 2.0 2.5		CL CL-CI	FILL: Sandy Gravelly CLAY - Low plas icity, brown, fine grained sand, angular to rounded gravel. 0.70m Sandy CLAY - Low to medium plas icity, orange-brown, fine grained sand. 1.30m Hole Terminated at 1.30 m Due to limit of required inves igation	D				FILL RESIDUAL SOIL

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP10

CLIENT: LEND LEASE
PAGE: 1 OF 1

PROJECT: MINIMUM 240 EXPANSION
JOB NO: NEW18P-0117

LOCATION: CESSNOCK GAOL, LINDSAY STREET, CESSNOCK NSW
LOGGED BY: SR

DATE: 14/6/18

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.6 m
DATUM: AHD

Drilling and Sampling					Material descrip ion and profile informa ion					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/par icle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
E	Not Observed	E 0.20m 0.40m E 0.50m		0.5		CL	TOPSOIL: Sandy CLAY - Low plasticity, dark brown, with fine grained sand, root affected. 0.25m Sandy CLAY - Low plas icity, red-brown and brown, fine grained sand. 0.80m	D				TOPSOIL RESIDUAL SOIL
				1.0 1.5 2.0 2.5			Hole Terminated at 0.80 m Due to limit of required inves igation					

LEGEND

Water
- Water Level (Date and time shown)
- Water Inflow
- Water Outflow

Strata Changes
- Gradational or transitional strata
- Definitive or distict strata change

Notes, Samples and Tests

U_{50}	50mm Diameter tube sample
CBR	Bulk sample for CBR testing
E	Environmental sample (Glass jar, sealed and chilled on site)
ASS	Acid Sulfate Soil Sample (Plastic bag, air expelled, chilled)
B	Bulk Sample

Field Tests

PID	Photoionisation detector reading (ppm)
DCP(x-y)	Dynamic penetrometer test (test depth interval shown)
HP	Hand Penetrometer test (UCS kPa)

Consistency

		UCS (kPa)
VS	Very Soft	<25
S	Soft	25 - 50
F	Firm	50 - 100
St	Stiff	100 - 200
VSt	Very Stiff	200 - 400
H	Hard	>400
Fb	Friable	

Density

V	Very Loose	Density Index <15%
L	Loose	Density Index 15 - 35%
MD	Medium Dense	Density Index 35 - 65%
D	Dense	Density Index 65 - 85%
VD	Very Dense	Density Index 85 - 100%

Moisture Condition

D	Dry
M	Moist
W	Wet
W_p	Plastic Limit
W_L	Liquid Limit

APPENDIX F:

Laboratory Results

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	602562-AID
Project Name	CESSNOCK CORRECTIONAL- LEND LEASE
Project ID	NEW18P-0117
Received Date	Jun 08, 2018
Date Reported	Jun 19, 2018

Methodology:

Asbestos Fibre Identification	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. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral f bres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter 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) is employed. *NOTE: 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 f bres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, poss bly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the l kelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name CESSNOCK CORRECTIONAL- LEND LEASE
Project ID NEW18P-0117
Date Sampled Jun 08, 2018
Report 602562-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS1	18-Jn12507	Jun 08, 2018	Approximate Sample 720g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS2	18-Jn12508	Jun 08, 2018	Approximate Sample 587g Sample consisted of: Brown coarse grain soil and rocks	AF: Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.0013g* Estimated asbestos content in AF = 0.0013g* Total estimated asbestos concentration in AF = 0.00022% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS12	18-Jn12509	Jun 08, 2018	Approximate Sample 486g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS27	18-Jn12510	Jun 08, 2018	Approximate Sample 457g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* 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	Jun 12, 2018	Indefinite

eurofins | mgt

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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 602562
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 8, 2018 2:30 PM
Due: Jun 18, 2018
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Acid Herbicides	Metals M8	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	SS1	Jun 08, 2018		Soil	M18-Jn12507	X	X	X	X	X	X	
2	SS2	Jun 08, 2018		Soil	M18-Jn12508	X	X	X	X	X	X	
3	SS12	Jun 08, 2018		Soil	M18-Jn12509	X	X	X	X	X	X	
4	SS27	Jun 08, 2018		Soil	M18-Jn12510	X	X	X	X	X	X	
5	QC1	Jun 08, 2018		Soil	M18-Jn12511			X	X	X	X	
6	QC2	Jun 08, 2018		Water	M18-Jn12512			X	X		X	
7	QC3	Jun 08, 2018		Water	M18-Jn12513							X
Test Counts						4	4	6	6	5	6	1

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 Standards 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

Samples Jn12509 & Jn12510 received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
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

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	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

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

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30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention: **Emma Coleman**

Report **602562-S**
Project name CESSNOCK CORRECTIONAL- LEND LEASE
Project ID NEW18P-0117
Received Date Jun 08, 2018

Client Sample ID			**SS1**	**SS2**	**SS12**	**SS27**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn12507**	**M18-Jn12508**	**M18-Jn12509**	**M18-Jn12510**
Date Sampled			**Jun 08, 2018**	**Jun 08, 2018**	**Jun 08, 2018**	**Jun 08, 2018**
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	71	21	50
TRH C15-C28	50	mg/kg	< 50	180	92	240
TRH C29-C36	50	mg/kg	< 50	140	88	200
TRH C10-36 (Total)	50	mg/kg	< 50	391	201	490
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	%	79	77	74	71
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	50	< 50	75
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	50	< 50	75
TRH >C16-C34	100	mg/kg	< 100	230	110	320
TRH >C34-C40	100	mg/kg	< 100	340	330	510
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

Client Sample ID			SS1	SS2	SS12	SS27
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn12507	M18-Jn12508	M18-Jn12509	M18-Jn12510
Date Sampled			Jun 08, 2018	Jun 08, 2018	Jun 08, 2018	Jun 08, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	103	89	96	98
p-Terphenyl-d14 (surr.)	1	%	81	65	82	77
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	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	95	83	84	112
Tetrachloro-m-xylene (surr.)	1	%	149	59	86	64
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			SS1	SS2	SS12	SS27
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn12507	M18-Jn12508	M18-Jn12509	M18-Jn12510
Date Sampled			Jun 08, 2018	Jun 08, 2018	Jun 08, 2018	Jun 08, 2018
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	73	63	63	62
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	95	83	84	112
Tetrachloro-m-xylene (surr.)	1	%	149	59	86	64
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-T	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dicamba	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPA	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Warfarin (surr.)	1	%	100	100	98	85

Client Sample ID			SS1	SS2	SS12	SS27
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn12507	M18-Jn12508	M18-Jn12509	M18-Jn12510
Date Sampled			Jun 08, 2018	Jun 08, 2018	Jun 08, 2018	Jun 08, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	14	4.7	6.9	5.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	27	24	23	14
Copper	5	mg/kg	< 5	18	7.6	5.1
Lead	5	mg/kg	11	35	13	15
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	19	13	7.6
Zinc	5	mg/kg	10	97	47	73
% Moisture	1	%	5.8	16	35	17

Client Sample ID			QC1
Sample Matrix			Soil
Eurofins | mgt Sample No.			M18-Jn12511
Date Sampled			Jun 08, 2018
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	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
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	%	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
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

Client Sample ID			QC1
Sample Matrix			Soil
Eurofins | mgt Sample No.			M18-Jn12511
Date Sampled			Jun 08, 2018
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
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	%	96
p-Terphenyl-d14 (surr.)	1	%	80
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
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	0.05	mg/kg	< 0.05
Toxaphene	1	mg/kg	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1
Dibutylchlorendate (surr.)	1	%	83
Tetrachloro-m-xylene (surr.)	1	%	126
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2

Client Sample ID			QC1
Sample Matrix			Soil
Eurofins | mgt Sample No.			M18-Jn12511
Date Sampled			Jun 08, 2018
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	67
Polychlorinated Biphenyls			
Aroclor-1016	0.1	mg/kg	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1
Total PCB*	0.1	mg/kg	< 0.1
Dibutylchlorendate (surr.)	1	%	83
Tetrachloro-m-xylene (surr.)	1	%	126
Heavy Metals			
Arsenic	2	mg/kg	19
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	28
Copper	5	mg/kg	< 5
Lead	5	mg/kg	14
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	7.2
Zinc	5	mg/kg	22
% Moisture	1	%	5.9

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	Jun 14, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jun 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 14, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 14, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Jun 14, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Jun 14, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Melbourne	Jun 14, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Acid Herbicides	Melbourne	Jun 14, 2018	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
Metals M8	Melbourne	Jun 14, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Jun 12, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261
Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 602562
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 8, 2018 2:30 PM
Due: Jun 18, 2018
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Acid Herbicides	Metals M8	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	SS1	Jun 08, 2018		Soil	M18-Jn12507	X	X	X	X	X	X	
2	SS2	Jun 08, 2018		Soil	M18-Jn12508	X	X	X	X	X	X	
3	SS12	Jun 08, 2018		Soil	M18-Jn12509	X	X	X	X	X	X	
4	SS27	Jun 08, 2018		Soil	M18-Jn12510	X	X	X	X	X	X	
5	QC1	Jun 08, 2018		Soil	M18-Jn12511			X	X	X	X	
6	QC2	Jun 08, 2018		Water	M18-Jn12512			X	X		X	
7	QC3	Jun 08, 2018		Water	M18-Jn12513							X
Test Counts						4	4	6	6	5	6	1

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. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg milligrams per kilogram

mg/L milligrams per litre

ug/L micrograms per litre

ppm Parts per million

ppb Parts per billion

% Percentage

org/100mL Organisms per 100 millilitres

NTU Nephelometric Turbidity Units

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

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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			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	%	113			70-130	Pass	
TRH C10-C14	%	95			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	82			70-130	Pass	
Toluene	%	80			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	82			70-130	Pass	
Xylenes - Total	%	81			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	103			70-130	Pass	
TRH C6-C10	%	116			70-130	Pass	
TRH >C10-C16	%	85			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	77			70-130	Pass	
Acenaphthylene	%	81			70-130	Pass	
Anthracene	%	82			70-130	Pass	
Benz(a)anthracene	%	77			70-130	Pass	
Benzo(a)pyrene	%	76			70-130	Pass	
Benzo(b&j)fluoranthene	%	95			70-130	Pass	
Benzo(g.h.i)perylene	%	89			70-130	Pass	
Benzo(k)fluoranthene	%	71			70-130	Pass	
Chrysene	%	78			70-130	Pass	
Dibenz(a.h)anthracene	%	80			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	%	74			70-130	Pass	
Fluorene	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	75			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
Phenanthrene	%	74			70-130	Pass	
Pyrene	%	74			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	120			70-130	Pass	
4.4'-DDE	%	106			70-130	Pass	
4.4'-DDT	%	77			70-130	Pass	
a-BHC	%	111			70-130	Pass	
Aldrin	%	116			70-130	Pass	
b-BHC	%	102			70-130	Pass	
d-BHC	%	106			70-130	Pass	
Dieldrin	%	115			70-130	Pass	
Endosulfan I	%	122			70-130	Pass	
Endosulfan II	%	105			70-130	Pass	
Endosulfan sulphate	%	108			70-130	Pass	
Endrin	%	118			70-130	Pass	
Endrin aldehyde	%	106			70-130	Pass	
Endrin ketone	%	111			70-130	Pass	
g-BHC (Lindane)	%	109			70-130	Pass	
Heptachlor	%	107			70-130	Pass	
Heptachlor epoxide	%	113			70-130	Pass	
Hexachlorobenzene	%	106			70-130	Pass	
Methoxychlor	%	117			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	115			70-130	Pass	
Dimethoate	%	82			70-130	Pass	
Ethion	%	93			70-130	Pass	
Fenitrothion	%	86			70-130	Pass	
Methyl parathion	%	72			70-130	Pass	
Mevinphos	%	107			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	93			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	114			70-130	Pass	
2.4-DB	%	119			70-130	Pass	
2.4.5-T	%	103			70-130	Pass	
2.4.5-TP	%	94			70-130	Pass	
Actril (loxynil)	%	92			70-130	Pass	
Dicamba	%	97			70-130	Pass	
Dichlorprop	%	100			70-130	Pass	
Dinitro-o-cresol	%	92			70-130	Pass	
Dinoseb	%	93			70-130	Pass	
MCPA	%	114			70-130	Pass	
MCPB	%	124			70-130	Pass	
Mecoprop	%	94			70-130	Pass	
LCS - % Recovery							
Heavy Metals							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic			%	105			80-120	Pass	
Cadmium			%	102			80-120	Pass	
Chromium			%	114			80-120	Pass	
Copper			%	108			80-120	Pass	
Lead			%	117			80-120	Pass	
Mercury			%	113			75-125	Pass	
Nickel			%	105			80-120	Pass	
Zinc			%	106			80-120	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	M18-Jn14792	NCP	%	85			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn14792	NCP	%	73			70-130	Pass	
Toluene	M18-Jn14792	NCP	%	74			70-130	Pass	
Ethylbenzene	M18-Jn14792	NCP	%	79			70-130	Pass	
m&p-Xylenes	M18-Jn14792	NCP	%	79			70-130	Pass	
o-Xylene	M18-Jn14792	NCP	%	78			70-130	Pass	
Xylenes - Total	M18-Jn14792	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jn14792	NCP	%	95			70-130	Pass	
TRH C6-C10	M18-Jn14792	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Jn12507	CP	%	81			70-130	Pass	
Acenaphthylene	M18-Jn12507	CP	%	85			70-130	Pass	
Anthracene	M18-Jn12507	CP	%	87			70-130	Pass	
Benz(a)anthracene	M18-Jn12507	CP	%	85			70-130	Pass	
Benzo(a)pyrene	M18-Jn12507	CP	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Jn12507	CP	%	98			70-130	Pass	
Benzo(g.h.i)perylene	M18-Jn12507	CP	%	74			70-130	Pass	
Benzo(k)fluoranthene	M18-Jn12507	CP	%	82			70-130	Pass	
Chrysene	M18-Jn12507	CP	%	88			70-130	Pass	
Dibenz(a.h)anthracene	M18-Jn12507	CP	%	87			70-130	Pass	
Fluoranthene	M18-Jn12507	CP	%	84			70-130	Pass	
Fluorene	M18-Jn12507	CP	%	83			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn12507	CP	%	79			70-130	Pass	
Naphthalene	M18-Jn12507	CP	%	80			70-130	Pass	
Phenanthrene	M18-Jn12507	CP	%	81			70-130	Pass	
Pyrene	M18-Jn12507	CP	%	83			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-Jn10720	NCP	%	106			70-130	Pass	
4.4'-DDE	M18-Jn10720	NCP	%	101			70-130	Pass	
4.4'-DDT	M18-Jn10720	NCP	%	95			70-130	Pass	
a-BHC	M18-Jn10720	NCP	%	95			70-130	Pass	
Aldrin	M18-Jn10720	NCP	%	108			70-130	Pass	
b-BHC	M18-Jn10720	NCP	%	103			70-130	Pass	
d-BHC	M18-Jn10720	NCP	%	109			70-130	Pass	
Dieldrin	M18-Jn10720	NCP	%	128			70-130	Pass	
Endosulfan I	M18-Jn10720	NCP	%	90			70-130	Pass	
Endosulfan II	M18-Jn10720	NCP	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	M18-Jn10720	NCP	%	87			70-130	Pass	
Endrin	M18-Jn10720	NCP	%	95			70-130	Pass	
Endrin aldehyde	M18-Jn10720	NCP	%	126			70-130	Pass	
Endrin ketone	M18-Jn10720	NCP	%	108			70-130	Pass	
g-BHC (Lindane)	M18-Jn10720	NCP	%	98			70-130	Pass	
Heptachlor	M18-Jn10720	NCP	%	95			70-130	Pass	
Heptachlor epoxide	M18-Jn10720	NCP	%	97			70-130	Pass	
Hexachlorobenzene	M18-Jn10720	NCP	%	100			70-130	Pass	
Methoxychlor	M18-Jn10720	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M18-Jn10915	NCP	%	125			70-130	Pass	
Dimethoate	M18-Jn10915	NCP	%	93			70-130	Pass	
Ethion	M18-Jn10915	NCP	%	105			70-130	Pass	
Fenitrothion	M18-Jn10915	NCP	%	93			70-130	Pass	
Methyl parathion	M18-Jn10915	NCP	%	79			70-130	Pass	
Mevinphos	M18-Jn10915	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	B18-Jn11359	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	M18-Jn13196	NCP	%	86			70-130	Pass	
Actril (loxynil)	M18-Jn13196	NCP	%	91			70-130	Pass	
Dichlorprop	M18-Jn13196	NCP	%	87			70-130	Pass	
MCPA	M18-Jn13196	NCP	%	88			70-130	Pass	
MCPB	M18-Jn13196	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Jn11661	NCP	%	111			75-125	Pass	
Cadmium	M18-Jn11661	NCP	%	114			75-125	Pass	
Chromium	M18-Jn11661	NCP	%	119			75-125	Pass	
Copper	M18-Jn11661	NCP	%	115			75-125	Pass	
Lead	M18-Jn11661	NCP	%	121			75-125	Pass	
Mercury	M18-Jn11661	NCP	%	105			70-130	Pass	
Nickel	M18-Jn11661	NCP	%	112			75-125	Pass	
Zinc	M18-Jn11661	NCP	%	116			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Jn12511	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Jn12511	CP	%	83			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	M18-Jn12507	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Jn12212	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Jn12212	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Jn12212	NCP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Jn12507	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Jn12507	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Jn12507	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Jn12507	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Jn12507	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Jn12507	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Jn12507	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Jn12507	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Jn12212	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Jn12212	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Jn12212	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Jn13810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Jn13810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Jn13810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Jn13810	NCP	mg/kg	1.2	1.1	8.0	30%	Pass	
Benzo(a)pyrene	M18-Jn13810	NCP	mg/kg	1.3	1.3	2.0	30%	Pass	
Benzo(b&j)fluoranthene	M18-Jn13810	NCP	mg/kg	1.0	1.0	5.0	30%	Pass	
Benzo(g.h.i)perylene	M18-Jn13810	NCP	mg/kg	0.8	0.8	1.0	30%	Pass	
Benzo(k)fluoranthene	M18-Jn13810	NCP	mg/kg	0.8	0.9	11	30%	Pass	
Chrysene	M18-Jn13810	NCP	mg/kg	1.4	1.3	8.0	30%	Pass	
Dibenz(a.h)anthracene	M18-Jn13810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Jn13810	NCP	mg/kg	2.1	2.4	11	30%	Pass	
Fluorene	M18-Jn13810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn13810	NCP	mg/kg	0.6	0.7	7.0	30%	Pass	
Naphthalene	M18-Jn13810	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Jn13810	NCP	mg/kg	1.3	1.3	1.0	30%	Pass	
Pyrene	M18-Jn13810	NCP	mg/kg	2.5	2.4	5.0	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Jn10763	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Jn10763	NCP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	M18-Jn10428	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	M18-Jn10428	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	M18-Jn10428	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	M18-Jn10428	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Jn10763	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
Dinoseb	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M18-Jn13183	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn12044	NCP	%	15	15	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn12511	CP	mg/kg	19	16	14	30%	Pass	
Cadmium	M18-Jn12511	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn12511	CP	mg/kg	28	25	13	30%	Pass	
Copper	M18-Jn12511	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M18-Jn12511	CP	mg/kg	14	14	1.0	30%	Pass	
Mercury	M18-Jn12511	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Jn12511	CP	mg/kg	7.2	6.5	10	30%	Pass	
Zinc	M18-Jn12511	CP	mg/kg	22	19	14	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
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

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

Certificate of Analysis

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention: **Emma Coleman**

Report **602562-W**
Project name CESSNOCK CORRECTIONAL- LEND LEASE
Project ID NEW18P-0117
Received Date Jun 08, 2018

Client Sample ID			**QC2**	**QC3**
Sample Matrix			**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Jn12512**	**M18-Jn12513**
Date Sampled			**Jun 08, 2018**	**Jun 08, 2018**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	-
BTEX				
Benzene	0.001	mg/L	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	67	65
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.001	mg/L	< 0.001	-
Acenaphthylene	0.001	mg/L	< 0.001	-
Anthracene	0.001	mg/L	< 0.001	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-
Chrysene	0.001	mg/L	< 0.001	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	-
Fluoranthene	0.001	mg/L	< 0.001	-
Fluorene	0.001	mg/L	< 0.001	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	-

Client Sample ID			QC2	QC3
Sample Matrix			Water	Water
Eurofins | mgt Sample No.			M18-Jn12512	M18-Jn12513
Date Sampled			Jun 08, 2018	Jun 08, 2018
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Naphthalene	0.001	mg/L	< 0.001	-
Phenanthrene	0.001	mg/L	< 0.001	-
Pyrene	0.001	mg/L	< 0.001	-
Total PAH*	0.001	mg/L	< 0.001	-
2-Fluorobiphenyl (surr.)	1	%	70	-
p-Terphenyl-d14 (surr.)	1	%	126	-
Organochlorine Pesticides				
Chlordanes - Total	0.001	mg/L	< 0.001	-
4.4'-DDD	0.0001	mg/L	< 0.0001	-
4.4'-DDE	0.0001	mg/L	< 0.0001	-
4.4'-DDT	0.0001	mg/L	< 0.0001	-
a-BHC	0.0001	mg/L	< 0.0001	-
Aldrin	0.0001	mg/L	< 0.0001	-
b-BHC	0.0001	mg/L	< 0.0001	-
d-BHC	0.0001	mg/L	< 0.0001	-
Dieldrin	0.0001	mg/L	< 0.0001	-
Endosulfan I	0.0001	mg/L	< 0.0001	-
Endosulfan II	0.0001	mg/L	< 0.0001	-
Endosulfan sulphate	0.0001	mg/L	< 0.0001	-
Endrin	0.0001	mg/L	< 0.0001	-
Endrin aldehyde	0.0001	mg/L	< 0.0001	-
Endrin ketone	0.0001	mg/L	< 0.0001	-
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	-
Heptachlor	0.0001	mg/L	< 0.0001	-
Heptachlor epoxide	0.0001	mg/L	< 0.0001	-
Hexachlorobenzene	0.0001	mg/L	< 0.0001	-
Methoxychlor	0.0001	mg/L	< 0.0001	-
Toxaphene	0.01	mg/L	< 0.01	-
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	-
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	-
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	-
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	-
Dibutylchlorendate (surr.)	1	%	68	-
Tetrachloro-m-xylene (surr.)	1	%	83	-
Organophosphorus Pesticides				
Azinphos-methyl	0.002	mg/L	< 0.002	-
Bolstar	0.002	mg/L	< 0.002	-
Chlorfenvinphos	0.002	mg/L	< 0.002	-
Chlorpyrifos	0.02	mg/L	< 0.02	-
Chlorpyrifos-methyl	0.002	mg/L	< 0.002	-
Coumaphos	0.02	mg/L	< 0.02	-
Demeton-S	0.02	mg/L	< 0.02	-
Demeton-O	0.002	mg/L	< 0.002	-
Diazinon	0.002	mg/L	< 0.002	-
Dichlorvos	0.002	mg/L	< 0.002	-
Dimethoate	0.002	mg/L	< 0.002	-
Disulfoton	0.002	mg/L	< 0.002	-
EPN	0.002	mg/L	< 0.002	-
Ethion	0.002	mg/L	< 0.002	-

Client Sample ID			QC2	QC3
Sample Matrix			Water	Water
Eurofins | mgt Sample No.			M18-Jn12512	M18-Jn12513
Date Sampled			Jun 08, 2018	Jun 08, 2018
Test/Reference	LOR	Unit		
Organophosphorus Pesticides				
Ethoprop	0.002	mg/L	< 0.002	-
Ethyl parathion	0.002	mg/L	< 0.002	-
Fenitrothion	0.002	mg/L	< 0.002	-
Fensulfothion	0.002	mg/L	< 0.002	-
Fenthion	0.002	mg/L	< 0.002	-
Malathion	0.002	mg/L	< 0.002	-
Merphos	0.002	mg/L	< 0.002	-
Methyl parathion	0.002	mg/L	< 0.002	-
Mevinphos	0.002	mg/L	< 0.002	-
Monocrotophos	0.002	mg/L	< 0.002	-
Naled	0.002	mg/L	< 0.002	-
Omethoate	0.002	mg/L	< 0.002	-
Phorate	0.002	mg/L	< 0.002	-
Pirimiphos-methyl	0.02	mg/L	< 0.02	-
Pyrazophos	0.002	mg/L	< 0.002	-
Ronnel	0.002	mg/L	< 0.002	-
Terbufos	0.002	mg/L	< 0.002	-
Tetrachlorvinphos	0.002	mg/L	< 0.002	-
Tokuthion	0.002	mg/L	< 0.002	-
Trichloronate	0.002	mg/L	< 0.002	-
Triphenylphosphate (surr.)	1	%	113	-
Polychlorinated Biphenyls				
Aroclor-1016	0.001	mg/L	< 0.001	-
Aroclor-1221	0.001	mg/L	< 0.001	-
Aroclor-1232	0.001	mg/L	< 0.001	-
Aroclor-1242	0.001	mg/L	< 0.001	-
Aroclor-1248	0.001	mg/L	< 0.001	-
Aroclor-1254	0.001	mg/L	< 0.001	-
Aroclor-1260	0.001	mg/L	< 0.001	-
Total PCB*	0.001	mg/L	< 0.001	-
Dibutylchlorendate (surr.)	1	%	68	-
Tetrachloro-m-xylene (surr.)	1	%	83	-
Heavy Metals				
Arsenic	0.001	mg/L	< 0.001	-
Cadmium	0.0002	mg/L	< 0.0002	-
Chromium	0.001	mg/L	< 0.001	-
Copper	0.001	mg/L	< 0.001	-
Lead	0.001	mg/L	< 0.001	-
Mercury	0.0001	mg/L	< 0.0001	-
Nickel	0.001	mg/L	< 0.001	-
Zinc	0.005	mg/L	< 0.005	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 13, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Melbourne	Jun 13, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 13, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jun 13, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 13, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 13, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Jun 13, 2018	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Jun 13, 2018	7 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Melbourne	Jun 13, 2018	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Melbourne	Jun 13, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | mgt

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NATA # 1261
Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 602562
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 8, 2018 2:30 PM
Due: Jun 18, 2018
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Acid Herbicides	Metals M8	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	SS1	Jun 08, 2018		Soil	M18-Jn12507	X	X	X	X	X	X	
2	SS2	Jun 08, 2018		Soil	M18-Jn12508	X	X	X	X	X	X	
3	SS12	Jun 08, 2018		Soil	M18-Jn12509	X	X	X	X	X	X	
4	SS27	Jun 08, 2018		Soil	M18-Jn12510	X	X	X	X	X	X	
5	QC1	Jun 08, 2018		Soil	M18-Jn12511			X	X	X	X	
6	QC2	Jun 08, 2018		Water	M18-Jn12512			X	X		X	
7	QC3	Jun 08, 2018		Water	M18-Jn12513							X
Test Counts						4	4	6	6	5	6	1

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. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg milligrams per kilogram

mg/L milligrams per litre

ug/L micrograms per litre

ppm Parts per million

ppb Parts per billion

% Percentage

org/100mL Organisms per 100 millilitres

NTU Nephelometric Turbidity Units

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

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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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 - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
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							
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
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							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.02			0.02	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.002			0.002	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	95			70-130	Pass	
TRH >C10-C16	%	72			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	94			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	85			70-130	Pass	
Toluene	%	85			70-130	Pass	
Ethylbenzene	%	82			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	
Xylenes - Total	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	77			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	110			70-130	Pass	
Benzo(a)pyrene	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	%	106			70-130	Pass	
Benzo(g.h.i)perylene	%	92			70-130	Pass	
Benzo(k)fluoranthene	%	108			70-130	Pass	
Chrysene	%	124			70-130	Pass	
Dibenz(a.h)anthracene	%	76			70-130	Pass	
Fluoranthene	%	108			70-130	Pass	
Fluorene	%	82			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	78			70-130	Pass	
Naphthalene	%	72			70-130	Pass	
Phenanthrene	%	87			70-130	Pass	
Pyrene	%	114			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	103			70-130	Pass	
4.4'-DDD	%	94			70-130	Pass	
4.4'-DDE	%	118			70-130	Pass	
4.4'-DDT	%	106			70-130	Pass	
a-BHC	%	95			70-130	Pass	
Aldrin	%	104			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
b-BHC	%	117			70-130	Pass	
d-BHC	%	125			70-130	Pass	
Dieldrin	%	127			70-130	Pass	
Endosulfan I	%	104			70-130	Pass	
Endosulfan II	%	117			70-130	Pass	
Endosulfan sulphate	%	96			70-130	Pass	
Endrin	%	92			70-130	Pass	
Endrin aldehyde	%	95			70-130	Pass	
Endrin ketone	%	96			70-130	Pass	
g-BHC (Lindane)	%	108			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Heptachlor epoxide	%	103			70-130	Pass	
Hexachlorobenzene	%	96			70-130	Pass	
Methoxychlor	%	73			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	107			70-130	Pass	
Dimethoate	%	96			70-130	Pass	
Ethion	%	105			70-130	Pass	
Fenitrothion	%	93			70-130	Pass	
Mevinphos	%	112			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	96			80-120	Pass	
Cadmium	%	87			80-120	Pass	
Chromium	%	89			80-120	Pass	
Copper	%	91			80-120	Pass	
Lead	%	90			80-120	Pass	
Mercury	%	96			75-125	Pass	
Nickel	%	94			80-120	Pass	
Zinc	%	95			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jn10665	NCP	%	71			70-130	Pass	
TRH C6-C10	M18-Jn10665	NCP	%	117			70-130	Pass	
TRH >C10-C16	M18-Jn09213	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Jn10665	NCP	%	117			70-130	Pass	
TRH C10-C14	M18-Jn09213	NCP	%	89			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn10665	NCP	%	93			70-130	Pass	
Toluene	M18-Jn10665	NCP	%	98			70-130	Pass	
Ethylbenzene	M18-Jn10665	NCP	%	98			70-130	Pass	
m&p-Xylenes	M18-Jn10665	NCP	%	99			70-130	Pass	
o-Xylene	M18-Jn10665	NCP	%	99			70-130	Pass	
Xylenes - Total	M18-Jn10665	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S18-Jn09898	NCP	%	95			70-130	Pass	
4.4'-DDD	S18-Jn09898	NCP	%	75			70-130	Pass	
4.4'-DDE	S18-Jn09898	NCP	%	83			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDT	S18-Jn09898	NCP	%	72			70-130	Pass	
a-BHC	S18-Jn09898	NCP	%	80			70-130	Pass	
Aldrin	S18-Jn09898	NCP	%	82			70-130	Pass	
b-BHC	S18-Jn09898	NCP	%	94			70-130	Pass	
d-BHC	S18-Jn09898	NCP	%	93			70-130	Pass	
Dieldrin	S18-Jn09898	NCP	%	76			70-130	Pass	
Endosulfan I	S18-Jn09898	NCP	%	76			70-130	Pass	
Endosulfan II	S18-Jn09898	NCP	%	84			70-130	Pass	
Endosulfan sulphate	S18-Jn09898	NCP	%	85			70-130	Pass	
Endrin	S18-Jn09898	NCP	%	74			70-130	Pass	
Endrin aldehyde	S18-Jn09898	NCP	%	89			70-130	Pass	
g-BHC (Lindane)	S18-Jn09898	NCP	%	88			70-130	Pass	
Heptachlor	S18-Jn09898	NCP	%	75			70-130	Pass	
Heptachlor epoxide	S18-Jn09898	NCP	%	80			70-130	Pass	
Hexachlorobenzene	S18-Jn09898	NCP	%	81			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Jn12434	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M18-Jn12434	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M18-Jn08961	NCP	mg/L	0.81	0.89	9.0	30%	Pass	
TRH >C16-C34	M18-Jn08961	NCP	mg/L	0.2	0.2	5.0	30%	Pass	
TRH >C34-C40	M18-Jn08961	NCP	mg/L	0.2	< 0.1	170	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Jn12434	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M18-Jn08961	NCP	mg/L	0.66	0.83	22	30%	Pass	
TRH C15-C28	M18-Jn08961	NCP	mg/L	0.4	0.4	9.0	30%	Pass	
TRH C29-C36	M18-Jn08961	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Jn12434	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-Jn12434	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-Jn12434	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-Jn12434	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-Jn12434	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-Jn12434	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S18-Jn09897	NCP	mg/L	0.001	0.001	18	30%	Pass	
Benzo(a)pyrene	S18-Jn09897	NCP	mg/L	0.002	0.002	1.0	30%	Pass	
Benzo(b&j)fluoranthene	S18-Jn09897	NCP	mg/L	0.001	0.001	9.0	30%	Pass	
Benzo(g.h.i)perylene	S18-Jn09897	NCP	mg/L	0.001	0.001	2.0	30%	Pass	
Benzo(k)fluoranthene	S18-Jn09897	NCP	mg/L	0.001	0.001	5.0	30%	Pass	
Chrysene	S18-Jn09897	NCP	mg/L	0.001	0.001	21	30%	Pass	
Dibenz(a.h)anthracene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S18-Jn09897	NCP	mg/L	0.003	0.003	21	30%	Pass	
Fluorene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-Jn09897	NCP	mg/L	0.001	0.001	10	30%	Pass	
Naphthalene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S18-Jn09897	NCP	mg/L	0.004	0.003	22	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S18-Jn09897	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
4.4'-DDD	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
4.4'-DDE	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
4.4'-DDT	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
a-BHC	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Aldrin	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
b-BHC	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
d-BHC	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Dieldrin	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endosulfan I	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endosulfan II	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endosulfan sulphate	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endrin	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endrin aldehyde	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Endrin ketone	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
g-BHC (Lindane)	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Heptachlor	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Heptachlor epoxide	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Hexachlorobenzene	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Methoxychlor	S18-Jn09897	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Toxaphene	M18-Jn10365	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1221	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1232	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1242	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1248	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1254	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Aroclor-1260	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Total PCB*	M18-Jn10365	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
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

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

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.

eurofins | mgt

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name :	Qualtest	**Contact Name:**	Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address :	8 Ironbark Close	**Project Manager :**	Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
	Warabrook NSW 2304	**Email for results :**	emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	Suite B1	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
1	SS1	8/06/2018	Soil	✓	✓	✓	✓	✓								1	1	
2	SS2	8/06/2018	Soil	✓	✓	✓	✓	✓								1	1	
3	SS12	8/06/2018	Soil	✓	✓	✓	✓	✓								1	1	
4	SS27	9/06/2018	Soil	✓	✓	✓	✓	✓								1	1	
5	QC1	10/06/2018	Soil	✓	✓		✓									1	1	
6	QC2	8/06/2018	Water	✓	✓		✓									1		
7	QC3								✓							1	1	
8																1	1	
9																1	1	
10																1	1	
11																		
12																		
13																		
14																		
15																		
16																		

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Laboratory Staff

Relinquished By: Libby Betz
Date & Time:: 08/06/2018
Signature:

Received By: SUE
Date & Time: 8/6/18 2-30pm
Signature: AW.

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: Standard

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

Will O'Haire
602562 12/6/18

eurofins | mgt

☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
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Email: EnviroSampleNSW@eurofins.com.au

☐ **Brisbane**
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Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
1	SS3	13/06/2018	Soil			⧹									1	1	
2	SS4	13/06/2018	Soil			⧹									1	1	
3	SS6	13/06/2018	Soil	⧹	⧹	⧹									1	1	
4	SS5	13/06/2018	Soil			⧹									1	1	
5	QC3	13/06/2018	Soil												1		
6	QC4	13/06/2018	Soil												1		
7	SS7	13/06/2018	Soil			⧹									1	1	
8	SS8	13/06/2018	Soil	⧹	⧹	⧹									1	1	
9	SS11	13/06/2018	Soil			⧹									1	1	
10	SS10	13/06/2018	Soil	⧹	⧹	⧹									1	1	
11	SS9	13/06/2018	Soil			⧹									1	1	
12	SS14	13/06/2018	Soil			⧹									1	1	
13	SS13	13/06/2018	Soil			⧹									1	1	
14	SS18	13/06/2018	Soil	⧹	⧹	⧹									1	1	
15	SS17	13/06/2018	Soil			⧹									1	1	
16	SS16	13/06/2018	Soil	⧹	⧹	⧹									1	1	

Some common holding times (with correct preservation).
For further information, contact the lab.

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Laboratory Staff

Relinquished By: Emma Coleman	**Received By:**
Date & Time:: 13/06/2018	**Date & Time:**
Signature:	**Signature:**

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # : Will O'Haire 15/6/18 603171

Temperature on arrival:

Report number:

eurofins | mgt

☐ **Sydney**
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☐ **Brisbane**
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Phone: +617 3902 4600
Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
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Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides
1	SS15	13/06/2018	Soil			☒		
2	SS20	13/06/2018	Soil	☒	☒	☒		
3	SS19	13/06/2018	Soil			☒		
4	SS25	13/06/2018	Soil			☒		
5	SS24	13/06/2018	Soil	☒	☒	☒		
6	SS23	13/06/2018	Soil			☒		
7	SS22	13/06/2018	Soil	☒	☒	☒		
8	SS21	13/06/2018	Soil			☒		
9	SS29	13/06/2018	Soil			☒		
10	SS28	13/06/2018	Soil			☒		
11	SS26	13/06/2018	Soil	☒	☒	☒		
12	SS33	13/06/2018	Soil			☒		
13	QC5	13/06/2018	Soil					
14								
15								
16								

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
				2				

Laboratory Staff

Relinquished By: Emma Coleman
Date & Time:: 13/06/2018
Signature:

Received By:
Date & Time:
Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Will O'Haire
15/6/18 603171

Temperature on arrival:

Report number:

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	603171-AID
Project Name	CESSNOCK CORRECTIONAL - LEND LEASE
Project ID	NEW18P-0117
Received Date	Jun 15, 2018
Date Reported	Jun 20, 2018

Methodology:

Asbestos Fibre Identification	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. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral f bres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter 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) is employed. *NOTE: 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 f bres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, poss bly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the l kelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name CESSNOCK CORRECTIONAL - LEND LEASE
Project ID NEW18P-0117
Date Sampled Jun 13, 2018
Report 603171-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS3	18-Jn16688	Jun 13, 2018	Approximate Sample 338g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS4	18-Jn16689	Jun 13, 2018	Approximate Sample 491g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS6	18-Jn16690	Jun 13, 2018	Approximate Sample 252g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS5	18-Jn16691	Jun 13, 2018	Approximate Sample 313g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS7	18-Jn16692	Jun 13, 2018	Approximate Sample 442g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS8	18-Jn16693	Jun 13, 2018	Approximate Sample 300g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS11	18-Jn16694	Jun 13, 2018	Approximate Sample 324g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS10	18-Jn16695	Jun 13, 2018	Approximate Sample 341g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS9	18-Jn16696	Jun 13, 2018	Approximate Sample 351g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS14	18-Jn16697	Jun 13, 2018	Approximate Sample 251g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS13	18-Jn16698	Jun 13, 2018	Approximate Sample 331g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS18	18-Jn16699	Jun 13, 2018	Approximate Sample 303g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS17	18-Jn16700	Jun 13, 2018	Approximate Sample 354g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS16	18-Jn16701	Jun 13, 2018	Approximate Sample 337g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS15	18-Jn16702	Jun 13, 2018	Approximate Sample 300g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS20	18-Jn16703	Jun 13, 2018	Approximate Sample 325g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS19	18-Jn16704	Jun 13, 2018	Approximate Sample 386g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS25	18-Jn16705	Jun 13, 2018	Approximate Sample 410g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS24	18-Jn16706	Jun 13, 2018	Approximate Sample 332g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS23	18-Jn16707	Jun 13, 2018	Approximate Sample 438g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS22	18-Jn16708	Jun 13, 2018	Approximate Sample 417g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS21	18-Jn16709	Jun 13, 2018	Approximate Sample 363g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS29	18-Jn16710	Jun 13, 2018	Approximate Sample 418g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS28	18-Jn16711	Jun 13, 2018	Approximate Sample 301g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS26	18-Jn16712	Jun 13, 2018	Approximate Sample 317g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS33	18-Jn16713	Jun 13, 2018	Approximate Sample 445g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* 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	Jun 15, 2018	Indefinite

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NATA # 1261
Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Qualtest	**Order No.:**		**Received:**	Jun 15, 2018 10:27 AM
Address:	8 Ironbark Close Warabrook NSW 2304	**Report #:** **Phone:** **Fax:**	603171 02 4968 4468 02 4960 9775	**Due:** **Priority:** **Contact Name:**	Jun 20, 2018 3 Day Emma Coleman
Project Name:	CESSNOCK CORRECTIONAL - LEND LEASE				
Project ID:	NEW18P-0117				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X
Sydney Laboratory - NATA Site # 18217						X				
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	SS3	Jun 13, 2018		Soil	M18-Jn16688	X			X	
2	SS4	Jun 13, 2018		Soil	M18-Jn16689	X			X	
3	SS6	Jun 13, 2018		Soil	M18-Jn16690	X		X	X	X
4	SS5	Jun 13, 2018		Soil	M18-Jn16691	X			X	
5	SS7	Jun 13, 2018		Soil	M18-Jn16692	X			X	
6	SS8	Jun 13, 2018		Soil	M18-Jn16693	X		X	X	X
7	SS11	Jun 13, 2018		Soil	M18-Jn16694	X			X	
8	SS10	Jun 13, 2018		Soil	M18-Jn16695	X		X	X	X
9	SS9	Jun 13, 2018		Soil	M18-Jn16696	X			X	

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web : www.eurofins.com.au

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Qualtest	**Order No.:**	
Address:	8 Ironbark Close Warabrook NSW 2304	**Report #:** **Phone:** **Fax:**	603171 02 4968 4468 02 4960 9775
Project Name:	CESSNOCK CORRECTIONAL - LEND LEASE		
Project ID:	NEW18P-0117		

Received:	Jun 15, 2018 10:27 AM
Due:	Jun 20, 2018
Priority:	3 Day
Contact Name:	Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X
Sydney Laboratory - NATA Site # 18217						X				
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
10	SS14	Jun 13, 2018		Soil	M18-Jn16697	X			X	
11	SS13	Jun 13, 2018		Soil	M18-Jn16698	X			X	
12	SS18	Jun 13, 2018		Soil	M18-Jn16699	X		X	X	X
13	SS17	Jun 13, 2018		Soil	M18-Jn16700	X			X	
14	SS16	Jun 13, 2018		Soil	M18-Jn16701	X		X	X	X
15	SS15	Jun 13, 2018		Soil	M18-Jn16702	X			X	
16	SS20	Jun 13, 2018		Soil	M18-Jn16703	X		X	X	X
17	SS19	Jun 13, 2018		Soil	M18-Jn16704	X			X	
18	SS25	Jun 13, 2018		Soil	M18-Jn16705	X			X	
19	SS24	Jun 13, 2018		Soil	M18-Jn16706	X		X	X	X
20	SS23	Jun 13, 2018		Soil	M18-Jn16707	X			X	
21	SS22	Jun 13, 2018		Soil	M18-Jn16708	X		X	X	X

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NATA # 1261 Site # 20794

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Site # 23736

Company Name:	Qualtest	**Order No.:**		**Received:**	Jun 15, 2018 10:27 AM
Address:	8 Ironbark Close Warabrook NSW 2304	**Report #:** **Phone:** **Fax:**	603171 02 4968 4468 02 4960 9775	**Due:** **Priority:** **Contact Name:**	Jun 20, 2018 3 Day Emma Coleman
Project Name:	CESSNOCK CORRECTIONAL - LEND LEASE				
Project ID:	NEW18P-0117				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X
Sydney Laboratory - NATA Site # 18217						X				
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
22	SS21	Jun 13, 2018		Soil	M18-Jn16709	X			X	
23	SS29	Jun 13, 2018		Soil	M18-Jn16710	X			X	
24	SS28	Jun 13, 2018		Soil	M18-Jn16711	X			X	
25	SS26	Jun 13, 2018		Soil	M18-Jn16712	X		X	X	X
26	SS33	Jun 13, 2018		Soil	M18-Jn16713	X			X	
27	QC3	Jun 13, 2018		Soil	M18-Jn16714		X			
28	QC4	Jun 13, 2018		Soil	M18-Jn16715		X			
29	QC5	Jun 13, 2018		Water	M18-Jn16716		X			
Test Counts						26	3	9	26	9

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 Standards 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

Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

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

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	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

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

eurofins | mgt

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention: **Emma Coleman**

Report **603171-S**
Project name CESSNOCK CORRECTIONAL - LEND LEASE
Project ID NEW18P-0117
Received Date Jun 15, 2018

Client Sample ID			**SS3**	**SS4**	**SS6**	**SS5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn16688**	**M18-Jn16689**	**M18-Jn16690**	**M18-Jn16691**
Date Sampled			**Jun 13, 2018**	**Jun 13, 2018**	**Jun 13, 2018**	**Jun 13, 2018**
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	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	55	-
TRH C10-36 (Total)	50	mg/kg	-	-	55	-
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	%	-	-	69	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
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	-

Client Sample ID			SS3	SS4	SS6	SS5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16688	M18-Jn16689	M18-Jn16690	M18-Jn16691
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	-	-	78	-
p-Terphenyl-d14 (surr.)	1	%	-	-	140	-
Heavy Metals						
Arsenic	2	mg/kg	-	-	4.2	-
Cadmium	0.4	mg/kg	-	-	< 0.4	-
Chromium	5	mg/kg	-	-	8.7	-
Copper	5	mg/kg	-	-	< 5	-
Lead	5	mg/kg	-	-	14	-
Mercury	0.1	mg/kg	-	-	< 0.1	-
Nickel	5	mg/kg	-	-	< 5	-
Zinc	5	mg/kg	-	-	32	-
% Moisture	1	%	12	10	12	10

Client Sample ID			SS7	SS8	SS11	SS10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16692	M18-Jn16693	M18-Jn16694	M18-Jn16695
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	67	-	61
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100

Client Sample ID			SS7	SS8	SS11	SS10
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16692	M18-Jn16693	M18-Jn16694	M18-Jn16695
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	76	-	67
p-Terphenyl-d14 (surr.)	1	%	-	132	-	118
Heavy Metals						
Arsenic	2	mg/kg	-	6.0	-	4.7
Cadmium	0.4	mg/kg	-	< 0.4	-	< 0.4
Chromium	5	mg/kg	-	16	-	9.2
Copper	5	mg/kg	-	< 5	-	< 5
Lead	5	mg/kg	-	12	-	13
Mercury	0.1	mg/kg	-	< 0.1	-	< 0.1
Nickel	5	mg/kg	-	7.1	-	< 5
Zinc	5	mg/kg	-	21	-	25
% Moisture	1	%	7.7	13	13	6.7

Client Sample ID			SS9	SS14	SS13	SS18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16696	M18-Jn16697	M18-Jn16698	M18-Jn16699
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
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	-	-	-	53
TRH C29-C36	50	mg/kg	-	-	-	76
TRH C10-36 (Total)	50	mg/kg	-	-	-	129

Client Sample ID			SS9	SS14	SS13	SS18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16696	M18-Jn16697	M18-Jn16698	M18-Jn16699
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
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	%	-	-	-	84
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	< 100
TRH >C34-C40	100	mg/kg	-	-	-	< 100
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	%	-	-	-	138
p-Terphenyl-d14 (surr.)	1	%	-	-	-	77
Heavy Metals						
Arsenic	2	mg/kg	-	-	-	4.5
Cadmium	0.4	mg/kg	-	-	-	< 0.4
Chromium	5	mg/kg	-	-	-	21
Copper	5	mg/kg	-	-	-	8.4
Lead	5	mg/kg	-	-	-	7.4
Mercury	0.1	mg/kg	-	-	-	< 0.1
Nickel	5	mg/kg	-	-	-	18
Zinc	5	mg/kg	-	-	-	38
% Moisture	1	%	12	19	16	12

Client Sample ID			SS17	SS16	SS15	SS20
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16700	M18-Jn16701	M18-Jn16702	M18-Jn16703
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	160	-	60
TRH C29-C36	50	mg/kg	-	190	-	97
TRH C10-36 (Total)	50	mg/kg	-	350	-	157
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	85	-	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	260	-	120
TRH >C34-C40	100	mg/kg	-	120	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	104	-	107
p-Terphenyl-d14 (surr.)	1	%	-	85	-	63
Heavy Metals						
Arsenic	2	mg/kg	-	4.8	-	4.6
Cadmium	0.4	mg/kg	-	< 0.4	-	< 0.4
Chromium	5	mg/kg	-	10	-	10
Copper	5	mg/kg	-	< 5	-	< 5

Client Sample ID			SS17	SS16	SS15	SS20
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16700	M18-Jn16701	M18-Jn16702	M18-Jn16703
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	-	14	-	13
Mercury	0.1	mg/kg	-	< 0.1	-	< 0.1
Nickel	5	mg/kg	-	< 5	-	< 5
Zinc	5	mg/kg	-	35	-	22
% Moisture	1	%	12	16	19	10

Client Sample ID			SS19	SS25	SS24	SS23
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16704	M18-Jn16705	M18-Jn16706	M18-Jn16707
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
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	-	-	92	-
TRH C29-C36	50	mg/kg	-	-	110	-
TRH C10-36 (Total)	50	mg/kg	-	-	202	-
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	%	-	-	86	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	150	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
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	-

Client Sample ID			SS19	SS25	SS24	SS23
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16704	M18-Jn16705	M18-Jn16706	M18-Jn16707
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	-	-	92	-
p-Terphenyl-d14 (surr.)	1	%	-	-	119	-
Heavy Metals						
Arsenic	2	mg/kg	-	-	5.7	-
Cadmium	0.4	mg/kg	-	-	< 0.4	-
Chromium	5	mg/kg	-	-	14	-
Copper	5	mg/kg	-	-	< 5	-
Lead	5	mg/kg	-	-	15	-
Mercury	0.1	mg/kg	-	-	< 0.1	-
Nickel	5	mg/kg	-	-	5.8	-
Zinc	5	mg/kg	-	-	31	-
% Moisture	1	%	14	10.0	6.9	6.9

Client Sample ID			SS22	SS21	SS29	SS28
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16708	M18-Jn16709	M18-Jn16710	M18-Jn16711
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
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	< 50	-	-	-
TRH C29-C36	50	mg/kg	51	-	-	-
TRH C10-36 (Total)	50	mg/kg	51	-	-	-
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	%	83	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-

Client Sample ID			SS22	SS21	SS29	SS28
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16708	M18-Jn16709	M18-Jn16710	M18-Jn16711
Date Sampled			Jun 13, 2018	Jun 13, 2018	Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit				
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	%	123	-	-	-
p-Terphenyl-d14 (surr.)	1	%	81	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	4.4	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	8.6	-	-	-
Copper	5	mg/kg	< 5	-	-	-
Lead	5	mg/kg	10	-	-	-
Mercury	0.1	mg/kg	< 0.1	-	-	-
Nickel	5	mg/kg	5.8	-	-	-
Zinc	5	mg/kg	13	-	-	-
% Moisture	1	%	11	11	8.6	12

Client Sample ID			SS26	SS33
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16712	M18-Jn16713
Date Sampled			Jun 13, 2018	Jun 13, 2018
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	60	-
TRH C29-C36	50	mg/kg	91	-
TRH C10-36 (Total)	50	mg/kg	151	-

Client Sample ID			SS26	SS33
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			M18-Jn16712	M18-Jn16713
Date Sampled			Jun 13, 2018	Jun 13, 2018
Test/Reference	LOR	Unit		
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	%	72	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-
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	%	135	-
p-Terphenyl-d14 (surr.)	1	%	86	-
Heavy Metals				
Arsenic	2	mg/kg	22	-
Cadmium	0.4	mg/kg	< 0.4	-
Chromium	5	mg/kg	52	-
Copper	5	mg/kg	< 5	-
Lead	5	mg/kg	19	-
Mercury	0.1	mg/kg	< 0.1	-
Nickel	5	mg/kg	6.4	-
Zinc	5	mg/kg	48	-
% Moisture	1	%	14	9.8

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Jun 18, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Jun 15, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

Perth
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Site # 23736

Company Name:	Qualtest	**Order No.:**		**Received:**	Jun 15, 2018 10:27 AM
Address:	8 Ironbark Close	**Report #:**	603171	**Due:**	Jun 20, 2018
	Warabrook	**Phone:**	02 4968 4468	**Priority:**	3 Day
	NSW 2304	**Fax:**	02 4960 9775	**Contact Name:**	Emma Coleman
Project Name:	CESSNOCK CORRECTIONAL - LEND LEASE				
Project ID:	NEW18P-0117				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X
Sydney Laboratory - NATA Site # 18217						X				
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	SS3	Jun 13, 2018		Soil	M18-Jn16688	X			X	
2	SS4	Jun 13, 2018		Soil	M18-Jn16689	X			X	
3	SS6	Jun 13, 2018		Soil	M18-Jn16690	X		X	X	X
4	SS5	Jun 13, 2018		Soil	M18-Jn16691	X			X	
5	SS7	Jun 13, 2018		Soil	M18-Jn16692	X			X	
6	SS8	Jun 13, 2018		Soil	M18-Jn16693	X		X	X	X
7	SS11	Jun 13, 2018		Soil	M18-Jn16694	X			X	
8	SS10	Jun 13, 2018		Soil	M18-Jn16695	X		X	X	X
9	SS9	Jun 13, 2018		Soil	M18-Jn16696	X			X	

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NATA # 1261
Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL - LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603171
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:27 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X
Sydney Laboratory - NATA Site # 18217						X				
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
10	SS14	Jun 13, 2018		Soil	M18-Jn16697	X			X	
11	SS13	Jun 13, 2018		Soil	M18-Jn16698	X			X	
12	SS18	Jun 13, 2018		Soil	M18-Jn16699	X		X	X	X
13	SS17	Jun 13, 2018		Soil	M18-Jn16700	X			X	
14	SS16	Jun 13, 2018		Soil	M18-Jn16701	X		X	X	X
15	SS15	Jun 13, 2018		Soil	M18-Jn16702	X			X	
16	SS20	Jun 13, 2018		Soil	M18-Jn16703	X		X	X	X
17	SS19	Jun 13, 2018		Soil	M18-Jn16704	X			X	
18	SS25	Jun 13, 2018		Soil	M18-Jn16705	X			X	
19	SS24	Jun 13, 2018		Soil	M18-Jn16706	X		X	X	X
20	SS23	Jun 13, 2018		Soil	M18-Jn16707	X			X	
21	SS22	Jun 13, 2018		Soil	M18-Jn16708	X		X	X	X

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Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Metals M8	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X
Sydney Laboratory - NATA Site # 18217						X				
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
22	SS21	Jun 13, 2018		Soil	M18-Jn16709	X			X	
23	SS29	Jun 13, 2018		Soil	M18-Jn16710	X			X	
24	SS28	Jun 13, 2018		Soil	M18-Jn16711	X			X	
25	SS26	Jun 13, 2018		Soil	M18-Jn16712	X		X	X	X
26	SS33	Jun 13, 2018		Soil	M18-Jn16713	X			X	
27	QC3	Jun 13, 2018		Soil	M18-Jn16714		X			
28	QC4	Jun 13, 2018		Soil	M18-Jn16715		X			
29	QC5	Jun 13, 2018		Water	M18-Jn16716		X			
Test Counts						26	3	9	26	9

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. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg milligrams per kilogram

mg/L milligrams per litre

ug/L micrograms per litre

ppm Parts per million

ppb Parts per billion

% Percentage

org/100mL Organisms per 100 millilitres

NTU Nephelometric Turbidity Units

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

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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			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	%	94			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	80			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	84			70-130	Pass	
Toluene	%	82			70-130	Pass	
Ethylbenzene	%	87			70-130	Pass	
m&p-Xylenes	%	87			70-130	Pass	
Xylenes - Total	%	87			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	121			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	81			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	83			70-130	Pass	
Acenaphthylene	%	90			70-130	Pass	
Anthracene	%	95			70-130	Pass	
Benz(a)anthracene	%	87			70-130	Pass	
Benzo(a)pyrene	%	78			70-130	Pass	
Benzo(b&j)fluoranthene	%	80			70-130	Pass	
Benzo(g.h.i)perylene	%	75			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a.h)anthracene	%	77			70-130	Pass	
Fluoranthene	%	90			70-130	Pass	
Fluorene	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	70			70-130	Pass	
Naphthalene	%	89			70-130	Pass	
Phenanthrene	%	88			70-130	Pass	
Pyrene	%	91			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	85			80-120	Pass	
Cadmium	%	84			80-120	Pass	
Chromium	%	82			80-120	Pass	
Copper	%	80			80-120	Pass	
Lead	%	92			80-120	Pass	
Mercury	%	101			75-125	Pass	
Nickel	%	89			80-120	Pass	
Zinc	%	89			80-120	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	M18-Jn16693	CP	%	97			70-130	Pass	
TRH C10-C14	M18-Jn16693	CP	%	76			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn16693	CP	%	81			70-130	Pass	
Toluene	M18-Jn16693	CP	%	82			70-130	Pass	
Ethylbenzene	M18-Jn16693	CP	%	82			70-130	Pass	
m&p-Xylenes	M18-Jn16693	CP	%	82			70-130	Pass	
o-Xylene	M18-Jn16693	CP	%	82			70-130	Pass	
Xylenes - Total	M18-Jn16693	CP	%	82			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jn16693	CP	%	100			70-130	Pass	
TRH C6-C10	M18-Jn16693	CP	%	102			70-130	Pass	
TRH >C10-C16	M18-Jn16693	CP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Jn16693	CP	%	76			70-130	Pass	
Acenaphthylene	M18-Jn16693	CP	%	84			70-130	Pass	
Anthracene	M18-Jn16693	CP	%	91			70-130	Pass	
Benz(a)anthracene	M18-Jn16693	CP	%	87			70-130	Pass	
Benzo(a)pyrene	M18-Jn16693	CP	%	83			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Jn16693	CP	%	71			70-130	Pass	
Benzo(g.h.i)perylene	M18-Jn16693	CP	%	87			70-130	Pass	
Benzo(k)fluoranthene	M18-Jn16693	CP	%	74			70-130	Pass	
Chrysene	M18-Jn16693	CP	%	91			70-130	Pass	
Dibenz(a.h)anthracene	M18-Jn16693	CP	%	95			70-130	Pass	
Fluoranthene	M18-Jn16693	CP	%	81			70-130	Pass	
Fluorene	M18-Jn16693	CP	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn16693	CP	%	88			70-130	Pass	
Naphthalene	M18-Jn16693	CP	%	79			70-130	Pass	
Phenanthrene	M18-Jn16693	CP	%	78			70-130	Pass	
Pyrene	M18-Jn16693	CP	%	81			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Jn16693	CP	%	112			75-125	Pass	
Cadmium	M18-Jn16693	CP	%	108			75-125	Pass	
Chromium	M18-Jn16693	CP	%	101			75-125	Pass	
Copper	M18-Jn16693	CP	%	101			75-125	Pass	
Lead	M18-Jn16693	CP	%	121			75-125	Pass	
Mercury	M18-Jn16693	CP	%	106			70-130	Pass	
Nickel	M18-Jn16693	CP	%	112			75-125	Pass	
Zinc	M18-Jn16693	CP	%	100			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn16688	CP	%	12	12	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Jn16690	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Jn16690	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Jn16690	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Jn16690	CP	mg/kg	55	62	12	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Jn16690	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Jn16690	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Jn16690	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Jn16690	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Jn16690	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Jn16690	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Jn16690	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Jn16840	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Jn16690	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Jn16690	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Jn16690	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn16690	CP	mg/kg	4.2	4.0	5.0	30%	Pass	
Cadmium	M18-Jn16690	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn16690	CP	mg/kg	8.7	8.0	9.0	30%	Pass	
Copper	M18-Jn16690	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M18-Jn16690	CP	mg/kg	14	15	6.0	30%	Pass	
Mercury	M18-Jn16690	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Jn16690	CP	mg/kg	< 5	5.0	12	30%	Pass	
Zinc	M18-Jn16690	CP	mg/kg	32	30	6.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn16693	CP	mg/kg	6.0	6.2	3.0	30%	Pass	
Cadmium	M18-Jn16693	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn16693	CP	mg/kg	16	16	1.0	30%	Pass	
Copper	M18-Jn16693	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M18-Jn16693	CP	mg/kg	12	12	1.0	30%	Pass	
Mercury	M18-Jn16693	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Jn16693	CP	mg/kg	7.1	7.3	3.0	30%	Pass	
Zinc	M18-Jn16693	CP	mg/kg	21	21	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn16698	CP	%	16	17	8.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn16708	CP	%	11	11	3.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
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

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

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	BTEX	ALS - Suite S-26
1	TP1 0.0-0.1	14/06/2018	Soil	\	\	\	\	\		
2	TP1 0.4-0.5	14/06/2018	Soil							
3	QC6	14/06/2018	Soil	\	\					
4	QC7	14/06/2018	Soil							\ Send QC7 to ALS
5	QC8	14/06/2018	Water						\	
6	TP2 0.0-0.2	14/06/2018	Soil			\	\	\		
7	TP2 0.4-0.5	14/06/2018	Soil							
8	TP2 0.9-1.0	14/06/2018	Soil							
9	TP3 0.0-0.1	14/06/2018	Soil			\	\	\		
10	TP3 0.4-0.5	14/06/2018	Soil							
11	TP3 0.9-1.0	14/06/2018	Soil							
12	TP3 1.5-1.6	14/06/2018	Soil							
13	TP3 1.9-2.0	14/06/2018	Soil							
14	TP4 0.0-0.2	14/06/2018	Soil	\	\	\	\	\		
15	TP4 0.4-0.5	14/06/2018	Soil							
16	TP4 0.9-1.0	14/06/2018	Soil							

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
						1	1	Send QC7 to ALS
						1	1	
						1		
						1		
				2				
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	
						1	1	

Laboratory Staff

Relinquished By: Emma Coleman
Date & Time:: 14/06/2018
Signature:

Received By: Chiara Benedetti
Date & Time: 15/6 10:30AM
Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 7.2

Report number: 603417

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Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
1	TP4 1.3-1.4	14/06/2018	Soil												1	1	
2	TP5 0.0-0.2	14/06/2018	Soil			⧹	⧹	⧹							1	1	
3	TP5 0.4-0.5	14/06/2018	Soil												1	1	
4	TP5 0.9-1.0	14/06/2018	Soil												1	1	
5	TP5 1.4-1.5	14/06/2018	Soil												1	1	
6	TP5 1.9-2.0	14/06/2018	Soil												1	1	
7	TP5 2.3-2.4	14/06/2018	Soil												1	1	
8	TP6 0.0-0.2	14/06/2018	Soil			⧹	⧹	⧹							1	1	
9	TP6 0.4-0.5	14/06/2018	Soil												1	1	
10	TP7 0.0-0.2	14/06/2018	Soil			⧹	⧹	⧹							1	1	
11	TP7 0.4-0.5	14/06/2018	Soil												1	1	
12	TP8 0.0-0.2	14/06/2018	Soil	⧹	⧹	⧹	⧹	⧹							1	1	
13	TP8 0.4-0.5	14/06/2018	Soil												1	1	
14	TP8 0.9-1.0	14/06/2018	Soil												1	1	
15	TP8 1.4-1.5	14/06/2018	Soil												1	1	
16	TP9 0.0-0.2	14/06/2018	Soil			⧹	⧹	⧹							1	1	

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Laboratory Staff

Relinquished By: Emma Coleman

Date & Time:: 14/06/2018

Signature:

Received By: Chiara Benedetti

Date & Time: 15/6 10:30AM

Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # :

Temperature on arrival: 7.2

Report number: 603417

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☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
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☐ **Melbourne**
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Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
1	TP9 0.4-0.5	14/06/2018	Soil												1	1	
2	TP9 0.9-1.0	14/06/2018	Soil												1	1	
3	TP10 0.0-0.2	14/06/2018	Soil	\	\	\	\	\							1	1	
4	TP10 0.4-0.5	14/06/2018	Soil												1	1	
5	SS34	14/06/2018	Soil			\									1	1	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
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Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Laboratory Staff

Relinquished By: Emma Coleman
Date & Time:: 14/06/2018
Signature:

Received By: Chiara Benedetti
Date & Time: 15/6 10:30AM
Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 7.2

Report number: 603417

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	603417-AID
Project Name	CESSNOCK CORRECTION- LEND LEASE
Project ID	NEW18P-0117
Received Date	Jun 15, 2018
Date Reported	Jun 20, 2018

Methodology:

Asbestos Fibre Identification	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. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral f bres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter 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) is employed. *NOTE: 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 f bres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, poss bly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the l kelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name CESSNOCK CORRECTION- LEND LEASE
Project ID NEW18P-0117
Date Sampled Jun 14, 2018
Report 603417-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP1 0.0-0.1	18-Jn18678	Jun 14, 2018	Approximate Sample 306g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP2 0.0-0.2	18-Jn18681	Jun 14, 2018	Approximate Sample 422g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP3 0.0-0.1	18-Jn18682	Jun 14, 2018	Approximate Sample 393g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP4 0.0-0.2	18-Jn18683	Jun 14, 2018	Approximate Sample 345g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP5 0.0-0.2	18-Jn18684	Jun 14, 2018	Approximate Sample 403g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP6 0.0-0.2	18-Jn18685	Jun 14, 2018	Approximate Sample 267g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP7 0.0-0.2	18-Jn18686	Jun 14, 2018	Approximate Sample 458g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP8 0.0-0.2	18-Jn18687	Jun 14, 2018	Approximate Sample 437g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP9 0.0-0.2	18-Jn18688	Jun 14, 2018	Approximate Sample 544g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP10 0.0-0.2	18-Jn18689	Jun 14, 2018	Approximate Sample 420g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS34	18-Jn18690	Jun 14, 2018	Approximate Sample 374g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* 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	Jun 18, 2018	Indefinite

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

Perth
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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Qualtest	**Order No.:**		**Received:**	Jun 15, 2018 10:30 AM
Address:	8 Ironbark Close Warabrook NSW 2304	**Report #:** **Phone:** **Fax:**	603417 02 4968 4468 02 4960 9775	**Due:** **Priority:** **Contact Name:**	Jun 20, 2018 3 Day Emma Coleman
Project Name:	CESSNOCK CORRECTION- LEND LEASE				
Project ID:	NEW18P-0117				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP1 0.0-0.1	Jun 14, 2018		Soil	M18-Jn18678	X		X	X		X	X	X
2	QC6	Jun 14, 2018		Soil	M18-Jn18679				X			X	X
3	QC8	Jun 14, 2018		Water	M18-Jn18680					X			
4	TP2 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18681	X		X			X	X	
5	TP3 0.0-0.1	Jun 14, 2018		Soil	M18-Jn18682	X		X			X	X	
6	TP4 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18683	X		X	X		X	X	X
7	TP5 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18684	X		X			X	X	
8	TP6 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18685	X		X			X	X	
9	TP7 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18686	X		X			X	X	

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Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	TP8 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18687	X		X	X		X	X	X
11	TP9 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18688	X		X			X	X	
12	TP10 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18689	X		X	X		X	X	X
13	SS34	Jun 14, 2018		Soil	M18-Jn18690	X							
14	TP1 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18691		X						
15	TP2 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18692		X						
16	TP2 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18693		X						
17	TP3 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18694		X						
18	TP3 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18695		X						
19	TP3 1.5-1.6	Jun 14, 2018		Soil	M18-Jn18696		X						
20	TP3 1.9-2.0	Jun 14, 2018		Soil	M18-Jn18697		X						
21	TP4 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18698		X						

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Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
22	TP4 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18699		X						
23	TP4 1.3-1.4	Jun 14, 2018		Soil	M18-Jn18700		X						
24	TP5 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18701		X						
25	TP5 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18702		X						
26	TP5 1.4-1.5	Jun 14, 2018		Soil	M18-Jn18703		X						
27	TP5 1.9-2.0	Jun 14, 2018		Soil	M18-Jn18704		X						
28	TP5 2.3-2.4	Jun 14, 2018		Soil	M18-Jn18705		X						
29	TP6 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18706		X						
30	TP7 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18707		X						
31	TP8 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18708		X						
32	TP8 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18709		X						
33	TP8 1.4-1.5	Jun 14, 2018		Soil	M18-Jn18710		X						

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Project Name:	CESSNOCK CORRECTION- LEND LEASE				
Project ID:	NEW18P-0117				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
34	TP9 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18711		X						
35	TP9 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18712		X						
36	TP10 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18713		X						
37	TP7 1.0-1.1	Jun 14, 2018		Soil	M18-Jn18739		X						
Test Counts						11	24	10	5	1	10	11	5

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 Standards 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

Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

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

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	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

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

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30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Emma Coleman**

Report **603417-S**
Project name CESSNOCK CORRECTION- LEND LEASE
Project ID NEW18P-0117
Received Date Jun 15, 2018

Client Sample ID			**TP1 0.0-0.1**	**QC6**	**TP2 0.0-0.2**	**TP3 0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn18678**	**M18-Jn18679**	**M18-Jn18681**	**M18-Jn18682**
Date Sampled			**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	94	59	-	-
TRH C29-C36	50	mg/kg	72	60	-	-
TRH C10-36 (Total)	50	mg/kg	166	119	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	-
o-Xylene	0.1	mg/kg	0.1	< 0.1	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	93	107	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	110	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-

Client Sample ID			TP1 0.0-0.1	QC6	TP2 0.0-0.2	TP3 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18678	M18-Jn18679	M18-Jn18681	M18-Jn18682
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	87	83	-	-
p-Terphenyl-d14 (surr.)	1	%	79	72	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	-	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	93	-	108	105
Tetrachloro-m-xylene (surr.)	1	%	66	-	104	77
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	-	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2

Client Sample ID			TP1 0.0-0.1	QC6	TP2 0.0-0.2	TP3 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18678	M18-Jn18679	M18-Jn18681	M18-Jn18682
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	-	< 2	< 2
Naled	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	-	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	95	-	92	86
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	93	-	108	105
Tetrachloro-m-xylene (surr.)	1	%	66	-	104	77
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2.4-DB	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2.4.5-T	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2.4.5-TP	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dicamba	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
MCPA	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
MCPB	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Warfarin (surr.)	1	%	102	-	99	92

Client Sample ID			TP1 0.0-0.1	QC6	TP2 0.0-0.2	TP3 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18678	M18-Jn18679	M18-Jn18681	M18-Jn18682
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	4.5	4.9	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	14	16	-	-
Copper	5	mg/kg	< 5	< 5	-	-
Lead	5	mg/kg	8.2	9.4	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Molybdenum	5	mg/kg	< 5	< 5	-	-
Nickel	5	mg/kg	5.8	5.8	-	-
Selenium	2	mg/kg	< 2	< 2	-	-
Silver	0.2	mg/kg	< 0.2	< 0.2	-	-
Tin	10	mg/kg	< 10	< 10	-	-
Zinc	5	mg/kg	15	14	-	-
% Moisture	1	%	8.2	7.4	11	5.3

Client Sample ID			TP4 0.0-0.2	TP5 0.0-0.2	TP6 0.0-0.2	TP7 0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18683	M18-Jn18684	M18-Jn18685	M18-Jn18686
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
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	< 50	-	-	-
TRH C29-C36	50	mg/kg	< 50	-	-	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	-	-
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	%	104	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	-
TRH C6-C10	20	mg/kg	< 20	-	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	-
TRH >C10-C16	50	mg/kg	< 50	-	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	-
TRH >C16-C34	100	mg/kg	< 100	-	-	-
TRH >C34-C40	100	mg/kg	< 100	-	-	-
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	-	-	-

Client Sample ID			TP4 0.0-0.2	TP5 0.0-0.2	TP6 0.0-0.2	TP7 0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18683	M18-Jn18684	M18-Jn18685	M18-Jn18686
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	74	-	-	-
p-Terphenyl-d14 (surr.)	1	%	74	-	-	-
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	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	91	95	95	90
Tetrachloro-m-xylene (surr.)	1	%	79	75	80	76

Client Sample ID			TP4 0.0-0.2	TP5 0.0-0.2	TP6 0.0-0.2	TP7 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn18683**	**M18-Jn18684**	**M18-Jn18685**	**M18-Jn18686**
Date Sampled			**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	97	101	101	112
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	91	95	95	90
Tetrachloro-m-xylene (surr.)	1	%	79	75	80	76

Client Sample ID			TP4 0.0-0.2	TP5 0.0-0.2	TP6 0.0-0.2	TP7 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn18683**	**M18-Jn18684**	**M18-Jn18685**	**M18-Jn18686**
Date Sampled			**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-T	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dicamba	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPA	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
MCPB	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Warfarin (surr.)	1	%	94	99	98	92
Heavy Metals						
Arsenic	2	mg/kg	14	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	32	-	-	-
Copper	5	mg/kg	< 5	-	-	-
Lead	5	mg/kg	15	-	-	-
Mercury	0.1	mg/kg	< 0.1	-	-	-
Molybdenum	5	mg/kg	< 5	-	-	-
Nickel	5	mg/kg	< 5	-	-	-
Selenium	2	mg/kg	< 2	-	-	-
Silver	0.2	mg/kg	< 0.2	-	-	-
Tin	10	mg/kg	< 10	-	-	-
Zinc	5	mg/kg	17	-	-	-
% Moisture	1	%	11	7.6	12	12

Client Sample ID			TP8 0.0-0.2	TP9 0.0-0.2	TP10 0.0-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn18687**	**M18-Jn18688**	**M18-Jn18689**
Date Sampled			**Jun 14, 2018**	**Jun 14, 2018**	**Jun 14, 2018**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	-	< 20
TRH C15-C28	50	mg/kg	< 50	-	< 50
TRH C29-C36	50	mg/kg	< 50	-	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	-	< 50
BTEX					
Benzene	0.1	mg/kg	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	113	-	113

Client Sample ID			TP8 0.0-0.2	TP9 0.0-0.2	TP10 0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18687	M18-Jn18688	M18-Jn18689
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	88	-	86
p-Terphenyl-d14 (surr.)	1	%	86	-	89
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05

Client Sample ID			TP8 0.0-0.2	TP9 0.0-0.2	TP10 0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18687	M18-Jn18688	M18-Jn18689
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit			
Organochlorine Pesticides					
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	87	92	83
Tetrachloro-m-xylene (surr.)	1	%	70	77	69
Organophosphorus Pesticides					
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	111	97	102

Client Sample ID			TP8 0.0-0.2	TP9 0.0-0.2	TP10 0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn18687	M18-Jn18688	M18-Jn18689
Date Sampled			Jun 14, 2018	Jun 14, 2018	Jun 14, 2018
Test/Reference	LOR	Unit			
Polychlorinated Biphenyls					
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	87	92	83
Tetrachloro-m-xylene (surr.)	1	%	70	77	69
Acid Herbicides					
2.4-D	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4-DB	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4.5-T	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2.4.5-TP	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Actril (loxynil)	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dicamba	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dichlorprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dinitro-o-cresol	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dinoseb	0.5	mg/kg	< 0.5	< 0.5	< 0.5
MCPA	0.5	mg/kg	< 0.5	< 0.5	< 0.5
MCPB	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Mecoprop	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Warfarin (surr.)	1	%	122	124	143
Heavy Metals					
Arsenic	2	mg/kg	3.7	-	17
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4
Chromium	5	mg/kg	9.1	-	35
Copper	5	mg/kg	< 5	-	< 5
Lead	5	mg/kg	8.0	-	18
Mercury	0.1	mg/kg	< 0.1	-	< 0.1
Molybdenum	5	mg/kg	< 5	-	< 5
Nickel	5	mg/kg	< 5	-	8.9
Selenium	2	mg/kg	< 2	-	< 2
Silver	0.2	mg/kg	< 0.2	-	< 0.2
Tin	10	mg/kg	< 10	-	< 10
Zinc	5	mg/kg	19	-	29
% Moisture	1	%	7.2	7.4	6.5

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Melbourne	Jun 18, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Acid Herbicides	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
Metals IWRG 621 : Metals M12	Melbourne	Jun 18, 2018	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Jun 18, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: Qualtest
Address: 8 Ironbark Close
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Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP1 0.0-0.1	Jun 14, 2018		Soil	M18-Jn18678	X		X	X		X	X	X
2	QC6	Jun 14, 2018		Soil	M18-Jn18679				X			X	X
3	QC8	Jun 14, 2018		Water	M18-Jn18680					X			
4	TP2 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18681	X		X			X	X	
5	TP3 0.0-0.1	Jun 14, 2018		Soil	M18-Jn18682	X		X			X	X	
6	TP4 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18683	X		X	X		X	X	X
7	TP5 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18684	X		X			X	X	
8	TP6 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18685	X		X			X	X	
9	TP7 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18686	X		X			X	X	

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Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	TP8 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18687	X		X	X		X	X	X
11	TP9 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18688	X		X			X	X	
12	TP10 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18689	X		X	X		X	X	X
13	SS34	Jun 14, 2018		Soil	M18-Jn18690	X							
14	TP1 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18691		X						
15	TP2 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18692		X						
16	TP2 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18693		X						
17	TP3 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18694		X						
18	TP3 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18695		X						
19	TP3 1.5-1.6	Jun 14, 2018		Soil	M18-Jn18696		X						
20	TP3 1.9-2.0	Jun 14, 2018		Soil	M18-Jn18697		X						
21	TP4 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18698		X						

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Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
22	TP4 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18699		X						
23	TP4 1.3-1.4	Jun 14, 2018		Soil	M18-Jn18700		X						
24	TP5 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18701		X						
25	TP5 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18702		X						
26	TP5 1.4-1.5	Jun 14, 2018		Soil	M18-Jn18703		X						
27	TP5 1.9-2.0	Jun 14, 2018		Soil	M18-Jn18704		X						
28	TP5 2.3-2.4	Jun 14, 2018		Soil	M18-Jn18705		X						
29	TP6 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18706		X						
30	TP7 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18707		X						
31	TP8 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18708		X						
32	TP8 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18709		X						
33	TP8 1.4-1.5	Jun 14, 2018		Soil	M18-Jn18710		X						

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Site # 23736

Company Name:	Qualtest	**Order No.:**		**Received:**	Jun 15, 2018 10:30 AM
Address:	8 Ironbark Close	**Report #:**	603417	**Due:**	Jun 20, 2018
	Warabrook	**Phone:**	02 4968 4468	**Priority:**	3 Day
	NSW 2304	**Fax:**	02 4960 9775	**Contact Name:**	Emma Coleman
Project Name:	CESSNOCK CORRECTION- LEND LEASE				
Project ID:	NEW18P-0117				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
34	TP9 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18711		X						
35	TP9 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18712		X						
36	TP10 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18713		X						
37	TP7 1.0-1.1	Jun 14, 2018		Soil	M18-Jn18739		X						
Test Counts						11	24	10	5	1	10	11	5

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. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg milligrams per kilogram

mg/L milligrams per litre

ug/L micrograms per litre

ppm Parts per million

ppb Parts per billion

% Percentage

org/100mL Organisms per 100 millilitres

NTU Nephelometric Turbidity Units

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

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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	120			70-130	Pass	
TRH C10-C14	%	71			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	70			70-130	Pass	
Toluene	%	116			70-130	Pass	
Ethylbenzene	%	127			70-130	Pass	
m&p-Xylenes	%	125			70-130	Pass	
Xylenes - Total	%	126			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	126			70-130	Pass	
TRH C6-C10	%	118			70-130	Pass	
TRH >C10-C16	%	92			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	94			70-130	Pass	
Acenaphthylene	%	98			70-130	Pass	
Anthracene	%	88			70-130	Pass	
Benz(a)anthracene	%	101			70-130	Pass	
Benzo(a)pyrene	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	%	83			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	85			70-130	Pass	
Chrysene	%	101			70-130	Pass	
Dibenz(a.h)anthracene	%	117			70-130	Pass	
Fluoranthene	%	100			70-130	Pass	
Fluorene	%	100			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	114			70-130	Pass	
Naphthalene	%	101			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	96			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	120			70-130	Pass	
4.4'-DDE	%	115			70-130	Pass	
4.4'-DDT	%	80			70-130	Pass	
a-BHC	%	99			70-130	Pass	
Aldrin	%	112			70-130	Pass	
b-BHC	%	101			70-130	Pass	
d-BHC	%	105			70-130	Pass	
Dieldrin	%	116			70-130	Pass	
Endosulfan I	%	115			70-130	Pass	
Endosulfan II	%	113			70-130	Pass	
Endosulfan sulphate	%	110			70-130	Pass	
Endrin	%	97			70-130	Pass	
Endrin aldehyde	%	120			70-130	Pass	
Endrin ketone	%	116			70-130	Pass	
g-BHC (Lindane)	%	101			70-130	Pass	
Heptachlor	%	103			70-130	Pass	
Heptachlor epoxide	%	113			70-130	Pass	
Hexachlorobenzene	%	96			70-130	Pass	
Methoxychlor	%	81			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	108			70-130	Pass	
Dimethoate	%	81			70-130	Pass	
Ethion	%	101			70-130	Pass	
Fenitrothion	%	95			70-130	Pass	
Methyl parathion	%	74			70-130	Pass	
Mevinphos	%	107			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	109			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	103			70-130	Pass	
2.4-DB	%	111			70-130	Pass	
2.4.5-T	%	95			70-130	Pass	
2.4.5-TP	%	87			70-130	Pass	
Actril (loxynil)	%	88			70-130	Pass	
Dicamba	%	91			70-130	Pass	
Dichlorprop	%	90			70-130	Pass	
Dinitro-o-cresol	%	87			70-130	Pass	
Dinoseb	%	88			70-130	Pass	
MCPA	%	104			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
MCPB			%	112			70-130	Pass	
Mecoprop			%	87			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	107			80-120	Pass	
Cadmium			%	106			80-120	Pass	
Chromium			%	115			80-120	Pass	
Copper			%	109			80-120	Pass	
Lead			%	110			80-120	Pass	
Mercury			%	109			75-125	Pass	
Molybdenum			%	107			80-120	Pass	
Nickel			%	107			80-120	Pass	
Selenium			%	104			80-120	Pass	
Silver			%	111			80-120	Pass	
Tin			%	115			80-120	Pass	
Zinc			%	108			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Jn15236	NCP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Jn15236	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Jn07714	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Jn18679	CP	%	97			75-125	Pass	
Cadmium	M18-Jn18679	CP	%	99			75-125	Pass	
Chromium	M18-Jn18679	CP	%	99			75-125	Pass	
Copper	M18-Jn18679	CP	%	104			75-125	Pass	
Lead	M18-Jn18679	CP	%	101			75-125	Pass	
Mercury	M18-Jn18679	CP	%	100			70-130	Pass	
Molybdenum	M18-Jn18679	CP	%	103			75-125	Pass	
Nickel	M18-Jn18679	CP	%	103			75-125	Pass	
Selenium	M18-Jn18679	CP	%	94			75-125	Pass	
Silver	M18-Jn18679	CP	%	102			75-125	Pass	
Tin	M18-Jn18679	CP	%	109			75-125	Pass	
Zinc	M18-Jn18679	CP	%	107			75-125	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	M18-Jn18681	CP	%	100			70-130	Pass	
Actril (loxynil)	M18-Jn18681	CP	%	92			70-130	Pass	
Dichlorprop	M18-Jn18681	CP	%	94			70-130	Pass	
MCPA	M18-Jn18681	CP	%	103			70-130	Pass	
MCPB	M18-Jn18681	CP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Jn18683	CP	%	120			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn18683	CP	%	75			70-130	Pass	
Toluene	M18-Jn18683	CP	%	101			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Ethylbenzene	M18-Jn18683	CP	%	121			70-130	Pass	
m&p-Xylenes	M18-Jn18683	CP	%	115			70-130	Pass	
o-Xylene	M18-Jn18683	CP	%	117			70-130	Pass	
Xylenes - Total	M18-Jn18683	CP	%	116			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jn18683	CP	%	117			70-130	Pass	
TRH C6-C10	M18-Jn18683	CP	%	119			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-Jn18683	CP	%	129			70-130	Pass	
4.4'-DDE	M18-Jn18683	CP	%	123			70-130	Pass	
4.4'-DDT	M18-Jn18683	CP	%	82			70-130	Pass	
a-BHC	M18-Jn18683	CP	%	104			70-130	Pass	
Aldrin	M18-Jn18683	CP	%	119			70-130	Pass	
b-BHC	M18-Jn18683	CP	%	109			70-130	Pass	
d-BHC	M18-Jn18683	CP	%	119			70-130	Pass	
Dieldrin	M18-Jn18683	CP	%	123			70-130	Pass	
Endosulfan I	M18-Jn18683	CP	%	122			70-130	Pass	
Endosulfan II	M18-Jn18683	CP	%	123			70-130	Pass	
Endosulfan sulphate	M18-Jn18683	CP	%	124			70-130	Pass	
Endrin	M18-Jn18683	CP	%	115			70-130	Pass	
Endrin aldehyde	M18-Jn18683	CP	%	120			70-130	Pass	
Endrin ketone	M18-Jn18683	CP	%	124			70-130	Pass	
g-BHC (Lindane)	M18-Jn18683	CP	%	107			70-130	Pass	
Heptachlor	M18-Jn18683	CP	%	114			70-130	Pass	
Heptachlor epoxide	M18-Jn18683	CP	%	120			70-130	Pass	
Hexachlorobenzene	M18-Jn18683	CP	%	104			70-130	Pass	
Methoxychlor	M18-Jn18683	CP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Jn18689	CP	%	86			70-130	Pass	
Acenaphthylene	M18-Jn18689	CP	%	93			70-130	Pass	
Anthracene	M18-Jn18689	CP	%	87			70-130	Pass	
Benz(a)anthracene	M18-Jn18689	CP	%	121			70-130	Pass	
Benzo(a)pyrene	M18-Jn18689	CP	%	120			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Jn18689	CP	%	88			70-130	Pass	
Benzo(g.h.i)perylene	M18-Jn18689	CP	%	97			70-130	Pass	
Benzo(k)fluoranthene	M18-Jn18689	CP	%	111			70-130	Pass	
Chrysene	M18-Jn18689	CP	%	101			70-130	Pass	
Dibenz(a.h)anthracene	M18-Jn18689	CP	%	90			70-130	Pass	
Fluoranthene	M18-Jn18689	CP	%	91			70-130	Pass	
Fluorene	M18-Jn18689	CP	%	91			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn18689	CP	%	83			70-130	Pass	
Naphthalene	M18-Jn18689	CP	%	95			70-130	Pass	
Phenanthrene	M18-Jn18689	CP	%	112			70-130	Pass	
Pyrene	M18-Jn18689	CP	%	91			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M18-Jn18689	CP	%	101			70-130	Pass	
Dimethoate	M18-Jn18689	CP	%	74			70-130	Pass	
Ethion	M18-Jn18689	CP	%	95			70-130	Pass	
Fenitrothion	M18-Jn18689	CP	%	91			70-130	Pass	
Methyl parathion	M18-Jn18689	CP	%	75			70-130	Pass	
Mevinphos	M18-Jn18689	CP	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Jn13353	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Jn13353	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Jn13353	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Jn13353	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Jn13353	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Jn13353	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinoseb	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M18-Jn18678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn18678	CP	mg/kg	4.5	4.8	7.0	30%	Pass	
Cadmium	M18-Jn18678	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn18678	CP	mg/kg	14	14	<1	30%	Pass	
Copper	M18-Jn18678	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M18-Jn18678	CP	mg/kg	8.2	11	30	30%	Pass	
Mercury	M18-Jn18678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Jn18678	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Jn18678	CP	mg/kg	5.8	6.0	3.0	30%	Pass	
Selenium	M18-Jn18678	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Jn18678	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Jn18678	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Jn18678	CP	mg/kg	15	13	10	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Jn18679	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Jn18679	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Jn18679	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Jn18679	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Jn18679	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Jn18679	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Jn18679	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Jn18679	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Jn18679	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn18679	CP	mg/kg	4.9	5.5	11	30%	Pass	
Cadmium	M18-Jn18679	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn18679	CP	mg/kg	16	18	11	30%	Pass	
Copper	M18-Jn18679	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M18-Jn18679	CP	mg/kg	9.4	10	9.0	30%	Pass	
Mercury	M18-Jn18679	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Jn18679	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Jn18679	CP	mg/kg	5.8	6.5	11	30%	Pass	
Selenium	M18-Jn18679	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Jn18679	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Jn18679	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Jn18679	CP	mg/kg	14	15	9.0	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Jn18682	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Jn18682	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Jn18682	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn18684	CP	%	7.6	7.5	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Jn18688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	M18-Jn18688	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	M18-Jn18688	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	M18-Jn18688	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	M18-Jn18688	CP	mg/kg	< 0.2	< 0.2	<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

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
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

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

Certificate of Analysis

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Emma Coleman**

Report **603417-W**
Project name CESSNOCK CORRECTION- LEND LEASE
Project ID NEW18P-0117
Received Date Jun 15, 2018

Client Sample ID			**QC8**
Sample Matrix			**Water**
Eurofins | mgt Sample No.			**M18-Jn18680**
Date Sampled			**Jun 14, 2018**
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	106

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
BTEX	Melbourne	Jun 18, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			

eurofins | mgt

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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	TP1 0.0-0.1	Jun 14, 2018		Soil	M18-Jn18678	X		X	X		X	X	X
2	QC6	Jun 14, 2018		Soil	M18-Jn18679				X			X	X
3	QC8	Jun 14, 2018		Water	M18-Jn18680					X			
4	TP2 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18681	X		X			X	X	
5	TP3 0.0-0.1	Jun 14, 2018		Soil	M18-Jn18682	X		X			X	X	
6	TP4 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18683	X		X	X		X	X	X
7	TP5 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18684	X		X			X	X	
8	TP6 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18685	X		X			X	X	
9	TP7 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18686	X		X			X	X	

eurofins | mgt

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Project ID: NEW18P-0117

Order No.:
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Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
10	TP8 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18687	X		X	X		X	X	X
11	TP9 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18688	X		X			X	X	
12	TP10 0.0-0.2	Jun 14, 2018		Soil	M18-Jn18689	X		X	X		X	X	X
13	SS34	Jun 14, 2018		Soil	M18-Jn18690	X							
14	TP1 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18691		X						
15	TP2 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18692		X						
16	TP2 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18693		X						
17	TP3 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18694		X						
18	TP3 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18695		X						
19	TP3 1.5-1.6	Jun 14, 2018		Soil	M18-Jn18696		X						
20	TP3 1.9-2.0	Jun 14, 2018		Soil	M18-Jn18697		X						
21	TP4 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18698		X						

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Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTION- LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603417
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 15, 2018 10:30 AM
Due: Jun 20, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
22	TP4 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18699		X						
23	TP4 1.3-1.4	Jun 14, 2018		Soil	M18-Jn18700		X						
24	TP5 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18701		X						
25	TP5 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18702		X						
26	TP5 1.4-1.5	Jun 14, 2018		Soil	M18-Jn18703		X						
27	TP5 1.9-2.0	Jun 14, 2018		Soil	M18-Jn18704		X						
28	TP5 2.3-2.4	Jun 14, 2018		Soil	M18-Jn18705		X						
29	TP6 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18706		X						
30	TP7 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18707		X						
31	TP8 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18708		X						
32	TP8 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18709		X						
33	TP8 1.4-1.5	Jun 14, 2018		Soil	M18-Jn18710		X						

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Sample Detail						Asbestos - WA guidelines	HOLD	Acid Herbicides	Metals IWRG 621 : Metals M12	BTEX	Eurofins | mgt Suite B15	Moisture Set	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X							
Brisbane Laboratory - NATA Site # 20794													
Perth Laboratory - NATA Site # 23736													
34	TP9 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18711		X						
35	TP9 0.9-1.0	Jun 14, 2018		Soil	M18-Jn18712		X						
36	TP10 0.4-0.5	Jun 14, 2018		Soil	M18-Jn18713		X						
37	TP7 1.0-1.1	Jun 14, 2018		Soil	M18-Jn18739		X						
Test Counts						11	24	10	5	1	10	11	5

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. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg milligrams per kilogram

mg/L milligrams per litre

ug/L micrograms per litre

ppm Parts per million

ppb Parts per billion

% Percentage

org/100mL Organisms per 100 millilitres

NTU Nephelometric Turbidity Units

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

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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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							
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	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
Xylenes - Total	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn18204	NCP	%	103			70-130	Pass	
Toluene	M18-Jn18204	NCP	%	103			70-130	Pass	
Ethylbenzene	M18-Jn18204	NCP	%	92			70-130	Pass	
m&p-Xylenes	M18-Jn18204	NCP	%	93			70-130	Pass	
o-Xylene	M18-Jn18204	NCP	%	95			70-130	Pass	
Xylenes - Total	M18-Jn18204	NCP	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Jn18203	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-Jn18203	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-Jn18203	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-Jn18203	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-Jn18203	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-Jn18203	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

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

Authorised By

Andrew Black	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1809723**	Page	: 1 of 6
Client	: **QUALTEST LABORATORY(NSW) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: EMMA COLEMAN	Contact	: Customer Services EM
Address	: 8 IRONBARK CLOSE WARABROOK NEW SOUTH WALES 4053	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 02 4968 4468	Telephone	: +61-3-8549 9600
Project	: NEW18P-0117	Date Samples Received	: 18-Jun-2018 10:15
Order number	:	Date Analysis Commenced	: 19-Jun-2018
C-O-C number	: ----	Issue Date	: 25-Jun-2018 15:15
Sampler	: ----		
Site	: ----		
Quote number	: SYBQ/388/15		
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 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*
Eric Chau	Metals Team Leader	Me bourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Me bourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Me bourne Organics, Springvale, VIC

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
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 concentra ion 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	QC7	----	----	----	----
			Client sampling date / time	14-Jun-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EM1809723-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**7.6**	----	----	----	----
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	**19**	----	----	----	----
Copper	7440-50-8	5	mg/kg	<5	----	----	----	----
Lead	7439-92-1	5	mg/kg	**9**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**7**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**16**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
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	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC7	----	----	----	----
				Client sampling date / time	14-Jun-2018 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM1809723-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
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**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**94.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**93.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**85.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**96.7**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**108**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**104**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**68.6**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**67.8**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)				Client sample ID	**QC7**	**----**	**----**	**----**	**----**
				Client sampling date / time	14-Jun-2018 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EM1809723-001**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		**94.7**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1809723**	Page	: 1 of 7
Client	: **QUALTEST LABORATORY(NSW) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: EMMA COLEMAN	Contact	: Customer Services EM
Address	: 8 IRONBARK CLOSE WARABROOK NEW SOUTH WALES 4053	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 02 4968 4468	Telephone	: +61-3-8549 9600
Project	: NEW18P-0117	Date Samples Received	: 18-Jun-2018
Order number	:	Date Analysis Commenced	: 19-Jun-2018
C-O-C number	: ----	Issue Date	: 25-Jun-2018
Sampler	: ----		
Site	: ----		
Quote number	: SYBQ/388/15		
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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Xing Lin	Senior Organic Chemist	Melbourne Organics, Springvale, VIC

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 (Dried @ 105-110°C) (QC Lot: 1737201)									
EM1809723-001	QC7	EA055: Moisture Content	----	0.1	%	7.6	8.4	10.7	No Limit
EM1809737-003	Anonymous	EA055: Moisture Content	----	0.1	%	13.1	12.9	1.70	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1739363)									
EM1809672-034	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	2	2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	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	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
EM1809720-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	44	44	0.00	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	21	20	6.26	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	11	11	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	15	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	19	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1739364)									
EM1809672-034	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1809720-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1739330)									
EM1809706-001	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

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: 1739330) - continued									
EM1809706-001	Anonymous	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
		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
EM1809763-004	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
		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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1737371)									
EM1809612-013	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1809612-067	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1739331)									
EM1809706-001	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
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1809763-004	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	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 (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1739331) - continued									
EM1809763-004	Anonymous	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
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1737371)									
EM1809612-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1809612-067	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1739331)									
EM1809706-001	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
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1809763-004	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
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 1737371)									
EM1809612-013	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
EM1809612-067	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

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: 1739363)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	85.4	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100.0	85	109
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.3	83	109
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	84.8	78	108
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	78.8	78	106
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	87.3	82	111
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	87.0	82	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1739364)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	85.3	77	104
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1739330)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	113	75	131
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	109	70	132
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	113	80	128
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	110	70	128
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	116	80	128
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	1.7 mg/kg	116	72	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	111	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	112	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	105	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	111	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	99.9	71	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	110	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	99.4	70	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	102	71	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	102	72	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	102	68	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1737371)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	84.5	70	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1739331)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	806 mg/kg	93.8	80	120
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3006 mg/kg	111	84	115
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1584 mg/kg	103	80	112
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----

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: 1737371)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	81.0	68	125
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1739331)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1160 mg/kg	97.2	83	117
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	3978 mg/kg	108	82	114
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	313 mg/kg	95.2	73	115
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN (QCLot: 1737371)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	74.6	74	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	87.4	77	125
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	82.6	73	125
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	90.8	77	128
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	89.8	81	128
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	73.5	66	130

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: 1739363)							
EM1809672-035	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	87.1	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	85.4	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	81 8	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	82.6	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	83 9	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	85 3	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	83 2	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1739364)							
EM1809672-035	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	86.4	76	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1739330)							
EM1809706-003	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	94.6	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	# Not Determined	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1737371)							

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*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1737371) - continued							
EM1809612-035	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	86 0	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1739331)							
EM1809706-002	Anonymous	EP071: C10 - C14 Fraction	----	806 mg/kg	100	53	123
		EP071: C15 - C28 Fraction	----	3006 mg/kg	109	70	124
		EP071: C29 - C36 Fraction	----	1584 mg/kg	102	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1737371)							
EM1809612-035	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	82 8	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1739331)							
EM1809706-002	Anonymous	EP071: >C10 - C16 Fraction	----	1160 mg/kg	100	65	123
		EP071: >C16 - C34 Fraction	----	3978 mg/kg	106	67	121
		EP071: >C34 - C40 Fraction	----	313 mg/kg	93 2	44	126
EP080: BTEXN (QCLot: 1737371)							
EM1809612-035	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	92.7	50	136
		EP080: Toluene	108-88-3	2 mg/kg	97 9	56	139

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1809723**	Page	: 1 of 5
Client	: **QUALTEST LABORATORY(NSW) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: EMMA COLEMAN	Telephone	: +61-3-8549 9600
Project	: NEW18P-0117	Date Samples Received	: 18-Jun-2018
Site	: ----	Issue Date	: 25-Jun-2018
Sampler	: ----	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample D	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1809706--003	Anonymous	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; o hers 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
QC7	**14-Jun-2018**	**----**	----	----	**19-Jun-2018**	28-Jun-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
QC7	**14-Jun-2018**	**21-Jun-2018**	11-Dec-2018	✓	**21-Jun-2018**	11-Dec-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
QC7	**14-Jun-2018**	**21-Jun-2018**	12-Jul-2018	✓	**22-Jun-2018**	12-Jul-2018	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
QC7	**14-Jun-2018**	**20-Jun-2018**	28-Jun-2018	✓	**20-Jun-2018**	30-Jul-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
QC7	**14-Jun-2018**	**19-Jun-2018**	28-Jun-2018	✓	**21-Jun-2018**	28-Jun-2018	✓
Soil Glass Jar - Unpreserved (EP071)							
QC7	**14-Jun-2018**	**20-Jun-2018**	28-Jun-2018	✓	**20-Jun-2018**	30-Jul-2018	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
QC7	**14-Jun-2018**	**19-Jun-2018**	28-Jun-2018	✓	**21-Jun-2018**	28-Jun-2018	✓
Soil Glass Jar - Unpreserved (EP071)							
QC7	**14-Jun-2018**	**20-Jun-2018**	28-Jun-2018	✓	**20-Jun-2018**	30-Jul-2018	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
QC7	**14-Jun-2018**	**19-Jun-2018**	28-Jun-2018	✓	**21-Jun-2018**	28-Jun-2018	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within he analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against a kane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point cal bration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	BTEX	pH and CEC
1	SS32	15/06/2018	Soil	✓	✓	✓				✓
2	SS35	15/06/2018	Soil	✓	✓	✓				
3	SS36	15/06/2018	Soil	✓	✓	✓				
4	SS30	15/06/2018	Soil	✓	✓	✓				
5	SS31	15/06/2018	Soil	✓	✓	✓				
6	SS46	15/06/2018	Soil	✓	✓	✓				✓
7	SS45	15/06/2018	Soil			✓				
8	SS43	15/06/2018	Soil			✓				
9	SS44	15/06/2018	Soil	✓	✓	✓				
10	SS47	15/06/2018	Soil			✓				
11	SS48	15/06/2018	Soil	✓	✓	✓				
12	SS49	15/06/2018	Soil			✓				
13	SS50	15/06/2018	Soil	✓	✓	✓				
14	SS41	15/06/2018	Soil	✓	✓	✓				
15	SS42	15/06/2018	Soil	✓	✓	✓				
16	SS39	15/06/2018	Soil	✓	✓	✓				

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1

Sample comments:

Laboratory Staff

Relinquished By: Emma Coleman
Date & Time:: 15/06/2018
Signature:

Received By: Will O'Haire
Date & Time: 19/6/18 603693
Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Qualtest	**Contact Name:** Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address : 8 Ironbark Close	**Project Manager :** Emma Coleman	**PROJECT Number :** NEW18P-0117	**Eurofins | mgt quote ID :** 170411QUAL_1
Warabrook NSW 2304	**Email for results :** emmacoleman@qualtest.com.au	**PROJECT Name :** Cessnock Correctional - Lend Lease	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Suite B4	Metals	Asbestos (NEPM/WA)	Suite B15 - OCPs/OPPs/PCBs	Herbicides	BTEX	pH and CEC	ALS - Suite S-26
1	SS40	15/06/2018	Soil	✓	✓	✓					
2	SS37	15/06/2018	Soil	✓	✓	✓					
3	SS38	15/06/2018	Soil	✓	✓	✓				✓	
4	QC9	15/06/2018	Soil								
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											

Some common holding times (with correct preservation).
For further information contact the lab.

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
						1	1	
						1	1	
						1	1	
						1	1	

Laboratory Staff

Relinquished By: Emma Coleman	**Received By:** Will O'Hair
Date & Time:: 15/06/2018	**Date & Time:** 19/6/18 603693
Signature:	**Signature:**

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☐ 10 DAY ☐ Other: 4 days

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival:

Report number:

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	603693-AID
Project Name	CESSNOCK CORRECTIONAL-LEND LEASE
Project ID	NEW18P-0117
Received Date	Jun 19, 2018
Date Reported	Jun 21, 2018

Methodology:

Asbestos Fibre Identification	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. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral f bres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter 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) is employed. *NOTE: 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 f bres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, poss bly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS4964 method for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the l kelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name CESSNOCK CORRECTIONAL-LEND LEASE
Project ID NEW18P-0117
Date Sampled Jun 15, 2018
Report 603693-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS32	18-Jn21483	Jun 15, 2018	Approximate Sample 429g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS35	18-Jn21484	Jun 15, 2018	Approximate Sample 321g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS36	18-Jn21485	Jun 15, 2018	Approximate Sample 326g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS30	18-Jn21486	Jun 15, 2018	Approximate Sample 384g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS31	18-Jn21487	Jun 15, 2018	Approximate Sample 273g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS46	18-Jn21488	Jun 15, 2018	Approximate Sample 517g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS45	18-Jn21489	Jun 15, 2018	Approximate Sample 414g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS43	18-Jn21490	Jun 15, 2018	Approximate Sample 382g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS44	18-Jn21491	Jun 15, 2018	Approximate Sample 514g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS47	18-Jn21492	Jun 15, 2018	Approximate Sample 339g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
SS48	18-Jn21493	Jun 15, 2018	Approximate Sample 395g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS49	18-Jn21494	Jun 15, 2018	Approximate Sample 381g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS50	18-Jn21495	Jun 15, 2018	Approximate Sample 387g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS41	18-Jn21496	Jun 15, 2018	Approximate Sample 346g Sample consisted of: Brown coarse grain soil and rocks	ACM: Chrysotile and amosite asbestos detected in f bre cement fragments. Approximate raw weight of ACM = 3.4g Total estimated asbestos content in ACM = 0.40g* Total estimated asbestos concentration in ACM = 0.12% w/w* Organic fibre detected. No respirable fibres detected.
SS42	18-Jn21497	Jun 15, 2018	Approximate Sample 355g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS39	18-Jn21498	Jun 15, 2018	Approximate Sample 336g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS40	18-Jn21499	Jun 15, 2018	Approximate Sample 277g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS37	18-Jn21500	Jun 15, 2018	Approximate Sample 333g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS38	18-Jn21501	Jun 15, 2018	Approximate Sample 321g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* 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	Jun 19, 2018	Indefinite

eurofins | mgt

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NATA # 1261
Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL-LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603693
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 19, 2018 2:51 PM
Due: Jun 21, 2018
Priority: 3 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals IWRG 621 : Metals M12	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	SS32	Jun 15, 2018		Soil	M18-Jn21483	X		X	X	X	X	X
2	SS35	Jun 15, 2018		Soil	M18-Jn21484	X				X		
3	SS36	Jun 15, 2018		Soil	M18-Jn21485	X			X	X		X
4	SS30	Jun 15, 2018		Soil	M18-Jn21486	X			X	X		X
5	SS31	Jun 15, 2018		Soil	M18-Jn21487	X				X		
6	SS46	Jun 15, 2018		Soil	M18-Jn21488	X		X	X	X	X	X
7	SS45	Jun 15, 2018		Soil	M18-Jn21489	X				X		
8	SS43	Jun 15, 2018		Soil	M18-Jn21490	X				X		
9	SS44	Jun 15, 2018		Soil	M18-Jn21491	X			X	X		X

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Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL-LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603693
Phone: 02 4968 4468
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Received: Jun 19, 2018 2:51 PM
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Contact Name: Emma Coleman

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Sample Detail						Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals IWRG 621 : Metals M12	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	SS47	Jun 15, 2018		Soil	M18-Jn21492	X				X		
11	SS48	Jun 15, 2018		Soil	M18-Jn21493	X			X	X		X
12	SS49	Jun 15, 2018		Soil	M18-Jn21494	X				X		
13	SS50	Jun 15, 2018		Soil	M18-Jn21495	X			X	X		X
14	SS41	Jun 15, 2018		Soil	M18-Jn21496	X			X	X		X
15	SS42	Jun 15, 2018		Soil	M18-Jn21497	X			X	X		X
16	SS39	Jun 15, 2018		Soil	M18-Jn21498	X			X	X		X
17	SS40	Jun 15, 2018		Soil	M18-Jn21499	X			X	X		X
18	SS37	Jun 15, 2018		Soil	M18-Jn21500	X			X	X		X
19	SS38	Jun 15, 2018		Soil	M18-Jn21501	X		X	X	X	X	X
20	QC9	Jun 15, 2018		Soil	M18-Jn21502		X					
Test Counts						19	1	3	13	19	3	13

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 Standards 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

Except Jn21491 and Jn21488: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

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

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	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

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

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30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Emma Coleman**

Report **603693-S**
Project name CESSNOCK CORRECTIONAL-LEND LEASE
Project ID NEW18P-0117
Received Date Jun 19, 2018

Client Sample ID			**SS32**	**SS35**	**SS36**	**SS30**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn21483**	**M18-Jn21484**	**M18-Jn21485**	**M18-Jn21486**
Date Sampled			**Jun 15, 2018**	**Jun 15, 2018**	**Jun 15, 2018**	**Jun 15, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	46	-	82	64
TRH C15-C28	50	mg/kg	89	-	240	250
TRH C29-C36	50	mg/kg	57	-	160	170
TRH C10-36 (Total)	50	mg/kg	192	-	482	484
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	-	78	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	78	67
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	78	67
TRH >C16-C34	100	mg/kg	< 100	-	270	280
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			SS32	SS35	SS36	SS30
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21483	M18-Jn21484	M18-Jn21485	M18-Jn21486
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	81	-	77	81
p-Terphenyl-d14 (surr.)	1	%	79	-	79	84
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	190	-	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	5.5	-	-	-
% Moisture	1	%	4.0	6.2	12	5.3
Heavy Metals						
Arsenic	2	mg/kg	12	-	19	9.7
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	24	-	29	17
Copper	5	mg/kg	< 5	-	5.5	20
Lead	5	mg/kg	16	-	22	23
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	-	< 5	< 5
Nickel	5	mg/kg	6.6	-	8.3	8.5
Selenium	2	mg/kg	< 2	-	< 2	< 2
Silver	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
Tin	10	mg/kg	< 10	-	< 10	< 10
Zinc	5	mg/kg	31	-	48	110
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	6.4	-	-	-

Client Sample ID			SS31	SS46	SS45	SS43
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21487	M18-Jn21488	M18-Jn21489	M18-Jn21490
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
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	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	-
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	%	-	97	-	-

Client Sample ID			SS31	SS46	SS45	SS43
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21487	M18-Jn21488	M18-Jn21489	M18-Jn21490
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
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	%	-	77	-	-
p-Terphenyl-d14 (surr.)	1	%	-	83	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	67	-	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	6.5	-	-
% Moisture	1	%	17	9.1	12	11
Heavy Metals						
Arsenic	2	mg/kg	-	9.4	-	-
Cadmium	0.4	mg/kg	-	< 0.4	-	-
Chromium	5	mg/kg	-	18	-	-
Copper	5	mg/kg	-	< 5	-	-
Lead	5	mg/kg	-	11	-	-
Mercury	0.1	mg/kg	-	< 0.1	-	-
Molybdenum	5	mg/kg	-	< 5	-	-
Nickel	5	mg/kg	-	7.8	-	-
Selenium	2	mg/kg	-	< 2	-	-
Silver	0.2	mg/kg	-	< 0.2	-	-
Tin	10	mg/kg	-	< 10	-	-
Zinc	5	mg/kg	-	34	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	11	-	-

Client Sample ID			SS44	SS47	SS48	SS49
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21491	M18-Jn21492	M18-Jn21493	M18-Jn21494
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	120	-	63	-
TRH C29-C36	50	mg/kg	110	-	100	-
TRH C10-36 (Total)	50	mg/kg	230	-	163	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	83	-	78	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	160	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	80	-	75	-
p-Terphenyl-d14 (surr.)	1	%	84	-	86	-
% Moisture	1	%	16	16	12	9.1

Client Sample ID			SS44	SS47	SS48	SS49
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21491	M18-Jn21492	M18-Jn21493	M18-Jn21494
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	5.6	-	6.7	-
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	-
Chromium	5	mg/kg	14	-	17	-
Copper	5	mg/kg	7.3	-	6.1	-
Lead	5	mg/kg	27	-	11	-
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	-
Molybdenum	5	mg/kg	< 5	-	< 5	-
Nickel	5	mg/kg	10	-	9.8	-
Selenium	2	mg/kg	< 2	-	< 2	-
Silver	0.2	mg/kg	< 0.2	-	< 0.2	-
Tin	10	mg/kg	< 10	-	< 10	-
Zinc	5	mg/kg	57	-	60	-

Client Sample ID			SS50	SS41	SS42	SS39
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21495	M18-Jn21496	M18-Jn21497	M18-Jn21498
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
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	83	95	60	73
TRH C29-C36	50	mg/kg	310	99	61	63
TRH C10-36 (Total)	50	mg/kg	393	194	121	136
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	%	95	99	85	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	120	140	< 100	< 100
TRH >C34-C40	100	mg/kg	330	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS50	SS41	SS42	SS39
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21495	M18-Jn21496	M18-Jn21497	M18-Jn21498
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	92	92	89	101
p-Terphenyl-d14 (surr.)	1	%	99	136	88	110
% Moisture	1	%	13	8.2	14	17
Heavy Metals						
Arsenic	2	mg/kg	3.7	4.2	3.0	3.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	21	16	18
Copper	5	mg/kg	< 5	12	8.3	12
Lead	5	mg/kg	8.7	9.6	7.2	9.1
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	6.3	19	13	14
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tin	10	mg/kg	< 10	< 10	< 10	< 10
Zinc	5	mg/kg	27	67	64	96

Client Sample ID			SS40	SS37	SS38
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21499	M18-Jn21500	M18-Jn21501
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	51
TRH C29-C36	50	mg/kg	140	100	55
TRH C10-36 (Total)	50	mg/kg	140	100	106
BTEX					
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1

Client Sample ID			SS40	SS37	SS38
Sample Matrix			Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Jn21499	M18-Jn21500	M18-Jn21501
Date Sampled			Jun 15, 2018	Jun 15, 2018	Jun 15, 2018
Test/Reference	LOR	Unit			
BTEX					
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	84	80
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	120	< 100
TRH >C34-C40	100	mg/kg	150	< 100	< 100
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	1.1	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.0	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	2.1	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	117	95	93
p-Terphenyl-d14 (surr.)	1	%	97	95	108
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	40
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	6.2
% Moisture	1	%	12	9.0	13
Heavy Metals					
Arsenic	2	mg/kg	3.8	2.4	2.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	8.6	12
Copper	5	mg/kg	16	5.5	8.7
Lead	5	mg/kg	17	9.1	6.3
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1
Molybdenum	5	mg/kg	< 5	< 5	< 5
Nickel	5	mg/kg	9.6	< 5	9.9
Selenium	2	mg/kg	< 2	< 2	< 2
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2
Tin	10	mg/kg	< 10	< 10	< 10
Zinc	5	mg/kg	240	48	59

Client Sample ID			SS40	SS37	SS38
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Jn21499**	**M18-Jn21500**	**M18-Jn21501**
Date Sampled			**Jun 15, 2018**	**Jun 15, 2018**	**Jun 15, 2018**
Test/Reference	LOR	Unit			
Cation Exchange Capacity					
Cation Exchange Capacity	0.05	meq/100g	-	-	6.1

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 20, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jun 20, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 20, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 20, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 20, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Jun 20, 2018	7 Day
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jun 21, 2018	180 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Jun 20, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Metals IWRG 621 : Metals M12	Melbourne	Jun 20, 2018	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Jun 19, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Project Name: CESSNOCK CORRECTIONAL-LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603693
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 19, 2018 2:51 PM
Due: Jun 26, 2018
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals IWRG 621 : Metals M12	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	SS32	Jun 15, 2018		Soil	M18-Jn21483	X		X	X	X	X	X
2	SS35	Jun 15, 2018		Soil	M18-Jn21484	X				X		
3	SS36	Jun 15, 2018		Soil	M18-Jn21485	X			X	X		X
4	SS30	Jun 15, 2018		Soil	M18-Jn21486	X			X	X		X
5	SS31	Jun 15, 2018		Soil	M18-Jn21487	X				X		
6	SS46	Jun 15, 2018		Soil	M18-Jn21488	X		X	X	X	X	X
7	SS45	Jun 15, 2018		Soil	M18-Jn21489	X				X		
8	SS43	Jun 15, 2018		Soil	M18-Jn21490	X				X		
9	SS44	Jun 15, 2018		Soil	M18-Jn21491	X			X	X		X

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Company Name: Qualtest
Address: 8 Ironbark Close
Warabrook
NSW 2304

Project Name: CESSNOCK CORRECTIONAL-LEND LEASE
Project ID: NEW18P-0117

Order No.:
Report #: 603693
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jun 19, 2018 2:51 PM
Due: Jun 26, 2018
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Metals IWRG 621 : Metals M12	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X						
Brisbane Laboratory - NATA Site # 20794												
Perth Laboratory - NATA Site # 23736												
10	SS47	Jun 15, 2018		Soil	M18-Jn21492	X				X		
11	SS48	Jun 15, 2018		Soil	M18-Jn21493	X			X	X		X
12	SS49	Jun 15, 2018		Soil	M18-Jn21494	X				X		
13	SS50	Jun 15, 2018		Soil	M18-Jn21495	X			X	X		X
14	SS41	Jun 15, 2018		Soil	M18-Jn21496	X			X	X		X
15	SS42	Jun 15, 2018		Soil	M18-Jn21497	X			X	X		X
16	SS39	Jun 15, 2018		Soil	M18-Jn21498	X			X	X		X
17	SS40	Jun 15, 2018		Soil	M18-Jn21499	X			X	X		X
18	SS37	Jun 15, 2018		Soil	M18-Jn21500	X			X	X		X
19	SS38	Jun 15, 2018		Soil	M18-Jn21501	X		X	X	X	X	X
20	QC9	Jun 15, 2018		Soil	M18-Jn21502		X					
Test Counts						19	1	3	13	19	3	13

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. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

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

Units

mg/kg milligrams per kilogram

mg/L milligrams per litre

ug/L micrograms per litre

ppm Parts per million

ppb Parts per billion

% Percentage

org/100mL Organisms per 100 millilitres

NTU Nephelometric Turbidity Units

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

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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	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	
Molybdenum	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Silver	mg/kg	< 0.2			0.2	Pass	
Tin	mg/kg	< 10			10	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	115			70-130	Pass	
TRH C10-C14	%	93			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	106			70-130	Pass	
Ethylbenzene	%	113			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
Xylenes - Total	%	109			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
TRH C6-C10	%	111			70-130	Pass	
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	109			70-130	Pass	
Acenaphthylene	%	110			70-130	Pass	
Anthracene	%	111			70-130	Pass	
Benz(a)anthracene	%	98			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	83			70-130	Pass	
Benzo(g.h.i)perylene	%	82			70-130	Pass	
Benzo(k)fluoranthene	%	84			70-130	Pass	
Chrysene	%	102			70-130	Pass	
Dibenz(a.h)anthracene	%	99			70-130	Pass	
Fluoranthene	%	84			70-130	Pass	
Fluorene	%	110			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	109			70-130	Pass	
Phenanthrene	%	100			70-130	Pass	
Pyrene	%	89			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Cadmium	%	107			80-120	Pass	
Chromium	%	116			80-120	Pass	
Copper	%	112			80-120	Pass	
Lead	%	114			80-120	Pass	
Mercury	%	90			75-125	Pass	
Molybdenum	%	108			80-120	Pass	
Nickel	%	112			80-120	Pass	
Selenium	%	103			80-120	Pass	
Silver	%	112			80-120	Pass	
Tin	%	116			80-120	Pass	
Zinc	%	109			80-120	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	M18-Jn21483	CP	%	111			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn21483	CP	%	96			70-130	Pass	
Toluene	M18-Jn21483	CP	%	105			70-130	Pass	
Ethylbenzene	M18-Jn21483	CP	%	113			70-130	Pass	
m&p-Xylenes	M18-Jn21483	CP	%	107			70-130	Pass	
o-Xylene	M18-Jn21483	CP	%	110			70-130	Pass	
Xylenes - Total	M18-Jn21483	CP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jn21483	CP	%	77			70-130	Pass	
TRH C6-C10	M18-Jn21483	CP	%	111			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Jn21496	CP	%	76			70-130	Pass	
Acenaphthylene	M18-Jn21496	CP	%	82			70-130	Pass	
Anthracene	M18-Jn21496	CP	%	81			70-130	Pass	
Benz(a)anthracene	M18-Jn21496	CP	%	92			70-130	Pass	
Benzo(a)pyrene	M18-Jn21496	CP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Jn21496	CP	%	108			70-130	Pass	
Benzo(g.h.i)perylene	M18-Jn21496	CP	%	120			70-130	Pass	
Benzo(k)fluoranthene	M18-Jn21496	CP	%	84			70-130	Pass	
Chrysene	M18-Jn21496	CP	%	81			70-130	Pass	
Dibenz(a.h)anthracene	M18-Jn21496	CP	%	104			70-130	Pass	
Fluoranthene	M18-Jn21496	CP	%	120			70-130	Pass	
Fluorene	M18-Jn21496	CP	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn21496	CP	%	106			70-130	Pass	
Naphthalene	M18-Jn21496	CP	%	73			70-130	Pass	
Phenanthrene	M18-Jn21496	CP	%	74			70-130	Pass	
Pyrene	M18-Jn21496	CP	%	118			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Jn21498	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Jn21498	CP	%	80			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Jn21498	CP	%	98			75-125	Pass	
Cadmium	M18-Jn21498	CP	%	101			75-125	Pass	
Chromium	M18-Jn21498	CP	%	109			75-125	Pass	
Copper	M18-Jn21498	CP	%	105			75-125	Pass	
Lead	M18-Jn21498	CP	%	105			75-125	Pass	
Mercury	M18-Jn21498	CP	%	88			70-130	Pass	
Molybdenum	M18-Jn21498	CP	%	104			75-125	Pass	
Nickel	M18-Jn21498	CP	%	105			75-125	Pass	
Selenium	M18-Jn21498	CP	%	96			75-125	Pass	
Silver	M18-Jn21498	CP	%	106			75-125	Pass	
Tin	M18-Jn21498	CP	%	112			75-125	Pass	
Zinc	M18-Jn21498	CP	%	110			75-125	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Jn21499	CP	%	88			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Jn21499	CP	%	76			70-130	Pass	
Toluene	M18-Jn21499	CP	%	83			70-130	Pass	
Ethylbenzene	M18-Jn21499	CP	%	92			70-130	Pass	
m&p-Xylenes	M18-Jn21499	CP	%	91			70-130	Pass	
o-Xylene	M18-Jn21499	CP	%	91			70-130	Pass	
Xylenes - Total	M18-Jn21499	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Jn21499	CP	%	83			70-130	Pass	
TRH C6-C10	M18-Jn21499	CP	%	86			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	M18-Jn21483	CP	uS/cm	190	200	2.2	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M18-Jn21483	CP	pH Units	5.5	5.4	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn21488	CP	%	9.1	9.9	9.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Jn21495	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Jn21495	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	M18-Jn21497	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Jn21497	CP	mg/kg	60	55	8.0	30%	Pass	
TRH C29-C36	M18-Jn21497	CP	mg/kg	61	< 50	32	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Jn21497	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Jn21497	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Jn21497	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn21497	CP	mg/kg	3.0	3.4	12	30%	Pass	
Cadmium	M18-Jn21497	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn21497	CP	mg/kg	16	17	8.0	30%	Pass	
Copper	M18-Jn21497	CP	mg/kg	8.3	8.8	6.0	30%	Pass	
Lead	M18-Jn21497	CP	mg/kg	7.2	7.4	2.0	30%	Pass	
Mercury	M18-Jn21497	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Jn21497	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Jn21497	CP	mg/kg	13	13	3.0	30%	Pass	
Selenium	M18-Jn21497	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Jn21497	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Jn21497	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Jn21497	CP	mg/kg	64	69	8.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Jn21498	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Jn21498	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Jn21498	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Jn21498	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Jn21498	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Jn21498	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Jn21498	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Jn21498	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Jn21498	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Jn21498	CP	%	17	17	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Jn21498	CP	mg/kg	3.2	3.2	<1	30%	Pass	
Cadmium	M18-Jn21498	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Jn21498	CP	mg/kg	18	18	1.0	30%	Pass	
Copper	M18-Jn21498	CP	mg/kg	12	12	2.0	30%	Pass	
Lead	M18-Jn21498	CP	mg/kg	9.1	9.0	<1	30%	Pass	
Mercury	M18-Jn21498	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M18-Jn21498	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M18-Jn21498	CP	mg/kg	14	14	1.0	30%	Pass	
Selenium	M18-Jn21498	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M18-Jn21498	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M18-Jn21498	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M18-Jn21498	CP	mg/kg	96	98	2.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Michael Brancati	Senior Analyst-Inorganic (VIC)
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

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

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.122/06/2018 11:33:19 AM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	C0											
12												
13	General Statistics											
14	Total Number of Observations					30		Number of Distinct Observations				11
15								Number of Missing Observations				0
16	Minimum					100		Mean				136.3
17	Maximum					320		Median				100
18	SD					64.78		Std. Error of Mean				11.83
19	Coefficient of Variation					0.475		Skewness				1.823
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic					0.623		Shapiro Wilk GOF Test				
23	5% Shapiro Wilk Critical Value					0.927		Data Not Normal at 5% Significance Level				
24	Lilliefors Test Statistic					0.333		Lilliefors GOF Test				
25	5% Lilliefors Critical Value					0.159		Data Not Normal at 5% Significance Level				
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL							95% UCLs (Adjusted for Skewness)				
30	95% Student's-t UCL					156.4		95% Adjusted-CLT UCL (Chen-1995)				160
31								95% Modified-t UCL (Johnson-1978)				157.1
32												
33	Gamma GOF Test											
34	A-D Test Statistic					4.672		Anderson-Darling Gamma GOF Test				
35	5% A-D Critical Value					0.746		Data Not Gamma Distributed at 5% Significance Level				
36	K-S Test Statistic					0.307		Kolmogorov-Smirnov Gamma GOF Test				
37	5% K-S Critical Value					0.16		Data Not Gamma Distributed at 5% Significance Level				
38	Data Not Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)					6.481		k star (bias corrected MLE)				5.855
42	Theta hat (MLE)					21.04		Theta star (bias corrected MLE)				23.29
43	nu hat (MLE)					388.8		nu star (bias corrected)				351.3
44	MLE Mean (bias corrected)					136.3		MLE Sd (bias corrected)				56.34
45								Approximate Chi Square Value (0.05)				308.9
46	Adjusted Level of Significance					0.041		Adjusted Chi Square Value				306.6
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))					155.1		95% Adjusted Gamma UCL (use when n<50)				156.2
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic					0.666		Shapiro Wilk Lognormal GOF Test				
53	5% Shapiro Wilk Critical Value					0.927		Data Not Lognormal at 5% Significance Level				
54	Lilliefors Test Statistic					0.299		Lilliefors Lognormal GOF Test				
55	5% Lilliefors Critical Value					0.159		Data Not Lognormal at 5% Significance Level				
56	Data Not Lognormal at 5% Significance Level											
57												

	A	B	C	D	E	F	G	H	I	J	K	L
58	Lognormal Statistics											
59				Minimum of Logged Data		4.605				Mean of logged Data		4.836
60				Maximum of Logged Data		5.768				SD of logged Data		0.373
61												
62	Assuming Lognormal Distribution											
63				95% H-UCL		153.5				90% Chebyshev (MVUE) UCL		162.9
64				95% Chebyshev (MVUE) UCL		175.6				97.5% Chebyshev (MVUE) UCL		193.3
65				99% Chebyshev (MVUE) UCL		228.1						
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data do not follow a Discernible Distribution (0.05)											
69												
70	Nonparametric Distribution Free UCLs											
71				95% CLT UCL		155.8				95% Jackknife UCL		156.4
72				95% Standard Bootstrap UCL		155.9				95% Bootstrap-t UCL		162.8
73				95% Hall's Bootstrap UCL		155.6				95% Percentile Bootstrap UCL		156.7
74				95% BCA Bootstrap UCL		160						
75				90% Chebyshev(Mean, Sd) UCL		171.8				95% Chebyshev(Mean, Sd) UCL		187.9
76				97.5% Chebyshev(Mean, Sd) UCL		210.2				99% Chebyshev(Mean, Sd) UCL		254
77												
78	Suggested UCL to Use											
79				95% Student's-t UCL		156.4				or 95% Modified-t UCL		157.1
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.122/06/2018 11:25:39 AM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	C0											
12												
13	General Statistics											
14	Total Number of Observations	30					Number of Distinct Observations	27				
15							Number of Missing Observations	0				
16	Minimum	10					Mean	50.43				
17	Maximum	240					Median	36.5				
18	SD	44.11					Std. Error of Mean	8.053				
19	Coefficient of Variation	0.875					Skewness	2.966				
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic	0.711					Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value	0.927					Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic	0.189					Lilliefors GOF Test					
25	5% Lilliefors Critical Value	0.159					Data Not Normal at 5% Significance Level					
26	Data Not Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
30	95% Student's-t UCL	64.12					95% Adjusted-CLT UCL (Chen-1995)	68.34				
31							95% Modified-t UCL (Johnson-1978)	64.84				
32												
33	Gamma GOF Test											
34	A-D Test Statistic	0.442					Anderson-Darling Gamma GOF Test					
35	5% A-D Critical Value	0.758					Detected data appear Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic	0.106					Kolmogorov-Smirnov Gamma GOF Test					
37	5% K-S Critical Value	0.162					Detected data appear Gamma Distributed at 5% Significance Level					
38	Detected data appear Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)	2.14					k star (bias corrected MLE)	1.949				
42	Theta hat (MLE)	23.56					Theta star (bias corrected MLE)	25.88				
43	nu hat (MLE)	128.4					nu star (bias corrected)	116.9				
44	MLE Mean (bias corrected)	50.43					MLE Sd (bias corrected)	36.13				
45							Approximate Chi Square Value (0.05)	92.95				
46	Adjusted Level of Significance	0.041					Adjusted Chi Square Value	91.72				
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50)	63.44					95% Adjusted Gamma UCL (use when n<50)	64.29				
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic	0.988					Shapiro Wilk Lognormal GOF Test					
53	5% Shapiro Wilk Critical Value	0.927					Data appear Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic	0.069					Lilliefors Lognormal GOF Test					
55	5% Lilliefors Critical Value	0.159					Data appear Lognormal at 5% Significance Level					
56	Data appear Lognormal at 5% Significance Level											
57												

	A	B	C	D	E	F	G	H	I	J	K	L
58	Lognormal Statistics											
59				Minimum of Logged Data		2.303				Mean of logged Data		3.669
60				Maximum of Logged Data		5.481				SD of logged Data		0.697
61												
62	Assuming Lognormal Distribution											
63				95% H-UCL		65.92				90% Chebyshev (MVUE) UCL		69.97
64				95% Chebyshev (MVUE) UCL		79.23				97.5% Chebyshev (MVUE) UCL		92.09
65				99% Chebyshev (MVUE) UCL		117.3						
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data appear to follow a Discernible Distribution at 5% Significance Level											
69												
70	Nonparametric Distribution Free UCLs											
71				95% CLT UCL		63.68				95% Jackknife UCL		64.12
72				95% Standard Bootstrap UCL		63.35				95% Bootstrap-t UCL		72.52
73				95% Hall's Bootstrap UCL		124.9				95% Percentile Bootstrap UCL		64.83
74				95% BCA Bootstrap UCL		69.57						
75				90% Chebyshev(Mean, Sd) UCL		74.59				95% Chebyshev(Mean, Sd) UCL		85.54
76				97.5% Chebyshev(Mean, Sd) UCL		100.7				99% Chebyshev(Mean, Sd) UCL		130.6
77												
78	Suggested UCL to Use											
79				95% Adjusted Gamma UCL		64.29						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												

APPENDIX G:

Data Validation Report

QA/QC DATA VALIDATION REPORT

CONTAMINATION ASSESSMENT, Lindsay Street, Cessnock

Eurofins report: 602562-S, 602562-W, 602562-AID, 603171-S, 603171-AID, 603417-S, 603417-W, 603693-S, 603693-AID
ALS report: EM1809723
Job No: NEW18P-0117

1. SAMPLE HANDLING

Item	Yes/No	Comments
Were the sample holding times met?	Yes	-
Were the samples in proper custody between collection in the field and reaching the laboratory?	Yes	-
Were the samples properly and adequately preserved?	Yes	-
Were the samples received by the laboratory in good condition?	Yes	-

Sampling Handling was:

Satisfactory :	✓	**Partially Satisfactory:**	**Unsatisfactory:**

2. PRECISION AND ACCURACY ASSESSMENT

Item	Yes/No	Comment
Was a NATA registered laboratory used?	Yes	-
Did the laboratory perform the requested tests?	Yes	-
Were the laboratory methods adopted NATA endorsed?	Yes	-
Were the appropriate test procedures followed?	Yes	-
Were the reporting limits satisfactory?	Yes	-
Was the NATA seal on the reports?	Yes	-
Were the reports signed by an authorised person?	Yes	-

Laboratory Precision and Accuracy was:

Satisfactory :	✓	**Partially Satisfactory:**	**Unsatisfactory:**

3. FIELD QA/QC

Item	Sample
Number of Samples Analysed	60 soil
Number of Days Sampling	4
Number of Sampling Events	4

Number and Type of QA/QC Samples Collected

Item	Sample
Field Duplicates (at least one in twenty samples)	2 intra-lab, 1 inter-lab
Trip Blanks (at least one per day or one per sampling event)	2
Wash Blanks (at least one per day, per matrix, or equipment)	0
Other (Trip blank and Trip Spike etc)	0
Were the reporting limits satisfactory?	Yes

Field Duplicates

Item	Yes/No	Comments
Were an adequate number of field duplicates collected?	Yes	Frequency of 1 per 20 fpr TRH, BTEX, PAH, and metals. 1 duplicate was tested for OCPs, OPPs, PCBs, due to the small number of primary samples analysed for these.
Were RPDs within control limits? Greater than 10 x EQL – 50% Less than 10 x EQL – 200%	Yes	It is noted that low analytes concentrations exaggerate the percentage differences with respect to small total concentration differences, therefore where results for the primary and duplicate samples were less than 10 times the LOR, the acceptable limit was set at 200%.

Trip Blanks/Trip Spikes

Item	Yes/No	Comments
Were an adequate number of trip blanks and Trip Spikes collected?	Yes	Two trip blanks were collected. No trip spikes were collected.

Were the trip blanks free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals).	Yes	
Were the trip spikes within recovery limits (between 100% and 120%)	N/A	

Rinsate Samples

Item	Yes/No	Comments
Were an adequate number of rinsate samples used? (1 per day of using reusable sampling equipment – trowel, hand auger etc)	Yes	Two equipment rinsate samples were collected on the 8 and 14 June 2018. As samples collected on the other two days were either sampled using the same methodology, or collected directly from the excavator bucket, the absence of an equipment rinsate each day is not considered to affect the data usability.
Were the rinsate samples free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals).	Yes	-

Field QC was:

Satisfactory :	✓	**Partially Satisfactory:**		**Unsatisfactory:**	

4. LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

A) Type of QA/QC Sample	Yes/No	Comments
Laboratory Blanks/Reagent Blanks (at least 1 per batch)	Yes	-
Laboratory Duplicates (at least 1 per batch or 1 per 10 samples)	Yes	-
Matrix Spikes, Matrix Spike Duplicates (1 for each sample type)	Yes	-
Laboratory Control Spike	Yes	-
Surrogate (where appropriate)	Yes	-

Item	Yes/No	Comments
B) Were the laboratory blanks and/or reagent blanks free of contamination?	Yes	-
C) Were the spike recoveries within control limits?	Yes	-
D) Were the RPDs of the laboratory duplicates within control limits?	No	The RPDs of the laboratory duplicates were within the control limits with the exception of duplicates in batch 602562-W for TRH>C34-C40, and batch 603693-S TRH C29-C36. In both case lab code Q15 was quoted: *"The RPD reported passes Eurofins | mgt's QC – Acceptance Criteria as defined in the internal Quality Control Review and Glossary page of this report".*
E) Were the surrogate recoveries within control limits?	Yes	-

Laboratory Internal QA/QC was:

Satisfactory :	✓	**Partially Satisfactory:**	**Unsatisfactory:**

5. DATA USABILITY

Item	Yes/No	Comments
Was the data directly usable?	Yes	-
Was the data usable with the following corrections/modifications? (see comments)	NA	-
Was the data not usable?	NA	-