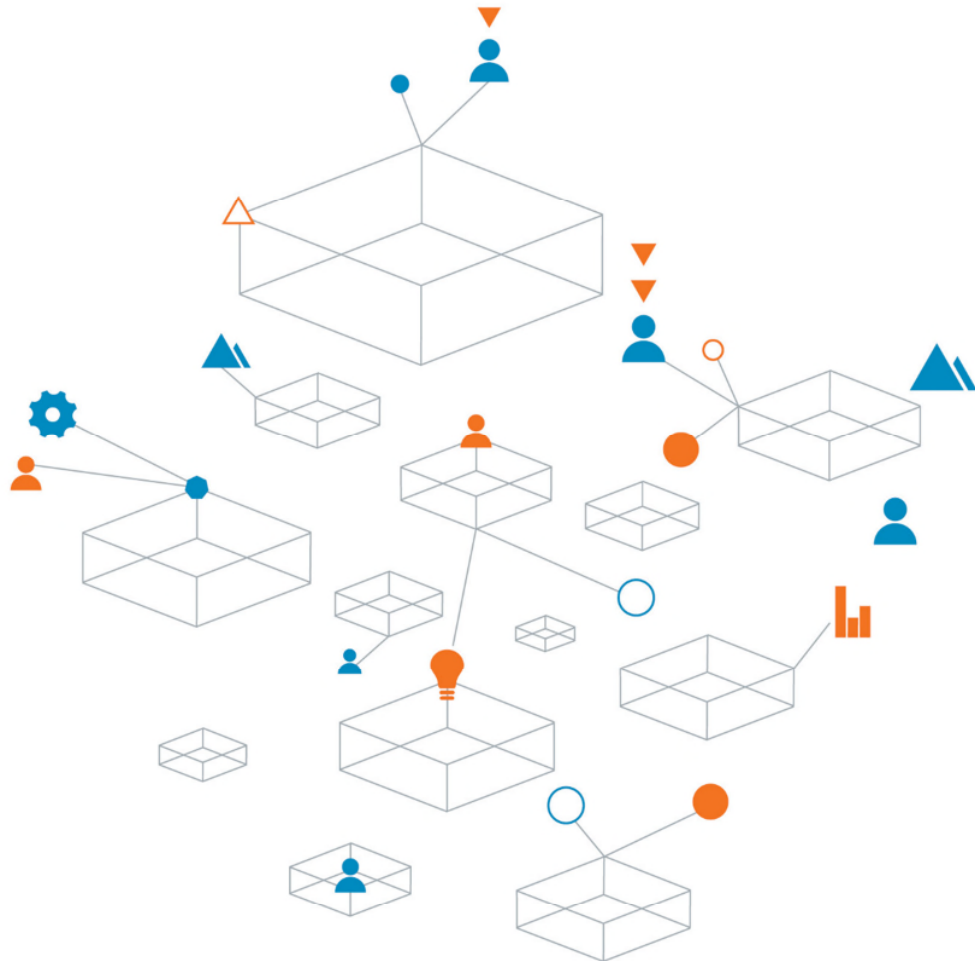


Preliminary Site Investigation

127 Union Street, Cooks Hill NSW (Lot 102 DP861562)

12 May 2021



Trust is the
cornerstone
of all our
projects

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Newcastle Grammar School

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Executive Summary

A site history review was undertaken as part of the Preliminary Site Investigation (PSI), and concluded:

- The Site was part of the Agricultural Company of Australia and or used by graziers up until 1947.
- From 1947 it was used as an Education facility, firstly as Crown Land then owned by Education Department
- Newcastle Grammar School has owned the Site from 1998.
- Prior to the 1950s the Site is likely to be low lying and undeveloped and used for agricultural purposes. The aerial photos indicate that between the 1950s and 1960s the Site was developed, and likely imported fill was used to raise the site level.
- The Site was not listed on the NSW EPA Contaminated Land Register or POEO Act register.
- The risk associated with nearby properties identified on the NSW EPA Contaminated Land Register or POEO public register was considered to be low.
- The Site was identified within an area of low occurrence of potential acid sulfate soils above about 3.0m depth.

The following data gap was identified following the desk study and site history review:

- Potentially impacted fill of unknown quality and quantity.

Ten boreholes were drilled across the Site and samples collected and analysed for a suite of chemicals of potential concern (COPC). The laboratory results showed concentrations of COPC below the adopted criteria for human health apart from one location BH4 at about 0.5m depth that contained polycyclic aromatic hydrocarbons (PAH) and Benzo a Pyrene (BaP) above the adopted criteria.

There were some exceedances of the adopted ecological criteria for copper and zinc.

The Conceptual Site Model (CSM) indicated that there was a complete exposure pathway for construction workers from the identified contamination. Provided the majority of the fill remains below buildings and is not exposed on the site surface, a complete exposure pathway to ecological receptors is unlikely to exist post construction. Based on the findings from the site history review and fieldworks undertaken, it is concluded that the exceedances observed at borehole location BH4 will require further assessment in order to satisfy suitably for the proposed development.

1. Introduction

Newcastle Grammar School are planning a partial redevelopment and refurbishment of the Newcastle Grammar School - Park Campus at 127 Union Street, Cooks Hill NSW (Lot 102, DP 861562) (the Site). APP Corporation Limited commissioned Coffey Services Australia Pty Ltd (Coffey) to prepare a Preliminary Site Investigation (PSI) to accompany a development application to Newcastle City Council. The site location (assessment areas only) is shown on Figure 1.

The partial redevelopment will require the demolition of existing buildings occupying the northern portion of the Site, which would be replaced with a new 3-storey building along the Union St boundary consisting of an under-croft play area, 2 levels of learning space and rooftop sports court, a new 2 storey building on the Corlette St side of the site consisting of a semi-basement level car park and 2 storeys of learning spaces, New kiss and drop internal roadway along the northern boundary- Refurbishment of Block B and Refurbishment of western side of Sandy Warren Centre. The proposed works will require major earthworks and spoil management activities during the construction phase of the redevelopment. This report is to be read in conjunction with Coffey Geotechnical Report (ref: 754-NTLGE282007-AD, dated 19th February 2021).

This report was prepared in accordance with the NSW EPA *Guidelines for Consultants reporting on contaminated Land: Contaminated land guidelines* (2020) and *SEPP 55 State Environmental Planning Policy 55 – Remediation of Land*.

1.1. Objectives

The objectives of the PSI are to:

- Identify evidence of potentially contaminating activities that may be currently occurring or had historically occurred on the Site.
- Identify Areas of Environmental Concern (AEC's) and Chemicals of Potential Concern (COPC's) for the Site, and develop a preliminary conceptual site model (CSM).
- Provide recommendations for further assessment and or management, as required.

2. Scope of works

The following sections outline the scope of works undertaken in order to meet the above objectives.

2.1. Desktop Assessment

- A review of published information and readily available information held on file by Coffey related to soils, geology and hydrogeology.
- A review of section 10.7 Certificates, Historical Aerial Images, Historical Titles and Workcover records for the Site.
- A site walkover to help identify AECs and COPCs.
- Review and collation of the above information and confirmation of potential AECs and COPC's for the Site and development of a preliminary CSM; and
- Preparation of this PSI report.

2.2. Sampling Plan

A sampling and analysis plan was developed prior to fieldworks to provide preliminary data related to the contamination status of the site soils. The combined assessment areas totalled 3,300m². A minimum of ten (10) assessment locations was therefore proposed to assess the partial redevelopment areas as outlined in the NSW EPA (1995) Contaminated Sites: Sample Design Guidelines.

The sampling plan undertaken consisted of the following:

- Soil assessment works consisted of drilling ten (10) boreholes with the aid of drill rig and hand auger to a maximum depth of 2.0mbgs (contamination) and 11mbgs (acid sulfate soils).
- Logging of soils encountered in each borehole was undertaken in accordance with the Unified Soil Classification System (USCS).
- Soil samples were collected directly into laboratory prepared 250mL glass sample containers (chemical analysis) and plastic ziplock bags (asbestos and acid sulfate soils).
- Screening of soils at regular intervals with a photoionisation detector (PID) for the presence of volatile organic compounds (i.e. petroleum hydrocarbons and solvents).
- Collection of soil samples at specific intervals within the soil profile including:
 - Two in the fill (or shallow soils <0.3 mbgs and 0.3 to 0.5 mbgs); and
 - One in the natural material (where achievable).
- With the potential for asbestos containing material to be impacting fill material, asbestos was analysed from a depth range of 0.0 to 0.25 mbgs and 0.25 to 0.5 mbgs at five (5) locations.
- Soils assessed for Acid Sulfate Soil were collected from (2) boreholes, with samples collected from the natural soil profiles (about 2.5mbgs) and every 0.5m thereafter to a target depth of 11mbgs (i.e. 1m below an estimated screw pile depth range); and
- Soil sampling locations were surveyed with a hand-held GPS unit, following completion.

2.3. Laboratory Analysis

Samples were submitted to a National Association of Testing Authorities (NATA) registered laboratory for analysis of one or more of the following COCs or COPCs:

- Heavy metals (i.e arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc)
- Total Recoverable Hydrocarbons (TRH)

- Benzene, Toluene, Ethylbenzene and Xylene (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Asbestos (targeting possible asbestos in fill)
- pH Field Screen (Acid Sulfate Soils)
- Chromium Reduced Sulfur (Acid Sulfate Soils)

Clay content, pH and cation exchange capacity (CEC) and iron were also analysed for the estimation of selected heavy metals (chromium, copper, nickel and zinc) to calculate site specific ecological investigation levels (EIL's). A background sample from outside potentially impacted areas was collected to provide background levels for EIL calculations from fill and natural material.

3. Site Background

3.1. Site Identification

The site layout plan outlining the development area is shown in Figure 1. The property and site identification details are provided in Table 3.1.

Table 3.1: Site identification summary

Property Address	127 Union Street, The Hill NSW
Approximate Site Area	Approximately 0.33 hectares (3,300m ²)
Title Identification Details for the Property	The Site comprises mainly the eastern portion Lot 102 DP861562
Current Land Zoning	R3 – Medium Density Residential
Current Land Use	Currently operating as a primary school facility
Proposed Land Use	Continuation as a primary school facility once partial redevelopment and refurbishment works are completed.
Adjoining Site Uses	- East – Corlette St and medium density residential - South – Parkway Ave and medium density residential - West – Union St and recreational sporting fields (national park); and - North – High-Medium density residential.
Site Co-ordinates	The centre of the Site is located approximately at Latitude: -32.934682° Longitude: 151.764966°

3.2. Site Topography and Drainage

The Site is near level and a mixture of open space with grass cover, buildings and pavements. Rain falling on the Site is likely to infiltrate into the site soils or drain towards the municipal stormwater system.

Surface water and stormwater is likely to drain in a southerly direction towards Cottage Creek storm water drain along the Site boundary. Cottage Creek eventually flows north and discharges into the Throsby Basin, part of Newcastle Harbour, located approximately 1.1 km to the north north-west of the Site.

3.3. Geology and Soils

Based on the 1:100,000 scale Newcastle Coalfield Geology map, the Site is underlain by Quaternary deposits comprising gravel, sand, silt and clay. Underling this unit is the late Permian aged Lambton Subgroup of the Newcastle Coal Measures comprising interbedded and interlaminated siltstone, sandstone and coal.

3.3.1. Acid Sulfate Soils

Reference to the Department of Land and Water Conservation Newcastle 1:25,000 Acid Sulfate Soil (ASS) Risk Map indicates that the Site is located within a Low Probability Acid Sulfate Soil risk area.

ASS if present, is expected to be buried by alluvium or windblown sediments at a depth range of greater than 3 metres below the ground surface (mbgs).

3.4. Hydrogeology

Groundwater beneath the Site was observed to be present in an unconfined or semi-confined aquifer at depths ranging from 1.4 - 1.8m below ground surface (mbgs). Regional groundwater flow is anticipated to follow the general slope of the region to the north west eventually discharging to the lower reaches of Cottage Creek. Cottage Creek eventually enters Newcastle Harbour about 1.1km to the north west.

A search of the Water NSW registered bores located within a 500m radius of the Site was undertaken. The search revealed that there were four (4) registered bores within this radius. The details of the registered bores are summarised below in Table 3.2 with specific details included in Appendix G.

Table 3.2: Summary of registered groundwater bores in the area.

Bore ID	Licence Status	Purpose	Standing Water Level (mbgs)	Bore Depth (mbgs)	Approximate Distance from South East Corner of Site
GW200589	Unknown	Irrigation	2.100	7.5	220m South West
GW055210	Current	Domestic	Unknown	4.5	220m North East
GW200588	Unknown	Irrigation	1.185	8.0	390m West
GW201379	Unknown	Domestic	4.100	6.2	310m South

4. Site History Review

4.1. Information Sources

A site history review was undertaken as part of the PSI, and included:

- A historical title search dating back 174 years (174 years).
- A review of aerial photography dating back to 1954.
- A review of the Section 10.7 (formerly Section 149) Planning Certificates for the Site held by AOD; and
- A review of NSW EPA notices applying to the Site and nearby properties.

The information provided from the above reviews is summarised in the sections below.

4.2. Historical Titles Search

A search of historical titles for the Site was undertaken by Advanced Legal Searchers Pty Ltd. A list of past registered proprietors for the lot was obtained dating back to 1847, the results of the search are included in Appendix E and presented below in Table 4.1 & Table 4.2.

Table 4.1: Summary of proprietors(s) - (Lot 102 DP861562)

Date	Proprietor(s)	Inferred Land Use
1998 - todate	Newcastle Grammar School Ltd (ACN 054 234 141)	Education Facility
1996 - 1998	Minister for Education & Training	Education Facility
	(Lot 1 DP746132)	
1987 - 1996	Minister for Education	Education Facility
	(Lots 101 & 102 DP717124)	
1985 - 1987	Minister for Education	Education Facility

Table 4.2: Summary of Historical Titles for (Lot 102 DP861562) - Notes (a) & (b)

Date	Proprietor(s)	Inferred Land Use
Note (a)	(Lots 163 to 174 Section L of the Australian Agricultural Company Subdivision – Area 1 Acre 3 Roods 19 ¾ Perches – Conv Bk 2037 No 973)	
1947 - 1985	His Most Gracious Majesty King George VI <i>(Behalf of Minister for Public Instruction for public school at Cook's Hill)</i>	Education Facility
	(Part of Grants of land – Crown Grant 2 Page 362)	
1847 - 1947	Australian Agriculture Company	Grazing
Note (b)	Lots 71 & 72 Section L of the Australian Agricultural Company Subdivision – Area 3 Acre 0 Roods 1 ¼ Perches – Conv Bk 2041 No 9)	
1947 - 1985	His Most Gracious Majesty King George VI <i>(Behalf of Minister for Public Instruction for public school at Cook's Hill)</i>	Education Facility

	(Lots 71 & 72 Section L of the Australian Agricultural Company Subdivision – Area 3 Acre 0 Roods 1 ¼ Perches – Conv Bk 1816 No 789)	
1938 - 1947	W.E Bramble & Sons Pty Limited	Grazing
	(Lots 71 & 72 Section L of the Australian Agricultural Company Subdivision – Area 3 Acre 0 Roods 1 ¼ Perches – Conv Bk 1231 No 837)	
1919 - 1938	Richard John Fry, Grazier	Grazing

4.3. Aerial Photograph Review

Table 4.3: Summary of Aerial Photographs Review

Date	Site	Surrounding Lands
1958	The Site is predominately vacant with eight buildings located on the northern section of the block of land. The Site appears to be grassed with areas of bare sections.	The land to the east, north and south of the Site appears to consist of residential housing and commercial properties. Land to the west consists of parkland. Through the centre of National Park consists of a drain which then runs to the south of the Site.
1966	The Site has had a number of structures built on it. There is less vegetation and grass on the Site.	Land directly to the west has had structures demolished and is vacant. The remaining surrounding areas appears similar to the previous aerial photograph.
1976	The Site has continued to have small structures built onto it.	The surrounding area appears similar to the previous aerial photograph.
1984	The Site appears similar to the previous aerial photograph.	The surrounding area appears similar to the previous aerial photograph.
1998	The Site appears similar to the previous aerial photograph.	The surrounding area to the north directly adjacent to the Site has had buildings demolished and had a single structure built on it. The vacant land to the east has seen numerous residential properties developed on it.
2001	Concrete pathways appear to have been constructed. Concrete pathways appear to provide pedestrian access to the Site from the east, west and southern perimeter boundaries. The remaining parts of the Site and structures have remained the similar.	The surrounding area appears similar to the previous Google Earth satellite image.
2007	The Site has had additional structures built within the easter and southern portion of the Site. It appears that the existing buildings have been updated.	The Site directly to the north is currently under construction for multi residential housing.
2017	The Site appears unchanged to the previous Google Earth satellite image.	The multi residential housing to the north is complete. The remaining surrounding area appears similar to the previous Google Earth satellite image.

4.4. Section 10.7 Planning Certificate

Table 4.4: Summary of Section 10.7 (2) & (5) information

Lot	Zoning	Critical Habitats	Conservation Areas	Hazard Risk Restrictions	Mine Subsidence Issues	Flooding Issues
Lot 102 DP861562	R3 – Medium Density Residential	None	None	Potential Acid Sulfate Soils & Land Contamination as stated in section 7 of 10.7 (5) Planning Certificate	Yes - The land is within a declared mine subsidence district	Yes – the property is subject to Flooding as defined in the Floodplain Development Manual (2005)

In relation to matters arising under the Contaminated Land Management (CLM) Act 1997, the following have been noted with respect to the Lots comprising the Site.

The lands are not:

- Significantly contaminated within the meaning of the Act.
- Subject to a management order within the meaning of the Act.
- Subject of a voluntary management proposal within the meaning of the Act.
- Subject to an ongoing maintenance order within the meaning of the Act.
- Subject of a site audit statement within the meaning of the Act.

4.5. NSW EPA Records

The Site and the surrounding area of Cooks Hill is not registered on the NSW EPA's POEO Public Register with an Environmental Protection License.

The former Council Depot at 152 Bruce Street and 115 Corlette Street is listed on the NSW EPA's Contaminated Site List and is located approximately 25m to the north east of the Site and positioned at a slightly higher elevation than the Site. Details of the contamination activity type is not specified. Any sub-surface contamination migrating from the former depot has the potential to migrate towards the Site.

No sites in the suburb of Cooks Hill are included on the Contaminated Land List of Contaminated Sites or List of Notified Sites.

A contaminated land register search is included in Appendix H.

4.6. Site Observations

A Coffey Environmental Scientist visited the Site on 18th January 2021 and completed a site walkover. Site photographs were taken during the visit and are shown in Appendix I.

Observations made during the site walkover included:

- The Site was observed to be relatively flat with buildings (classrooms/auditorium) located along the southern and western site boundaries.
- The Site was bound by Union Street to the north east, Parkway Avenue to the south-west and Corlette Street to the south east.

- The internal and external building structures were observed to be in good to fair condition with no evidence of weathering of building materials observed on internal and external wall linings.
- The Site ground surface was maintained regularly, with fresh grassed vegetation and landscaped gardens observed adjacent the school infrastructure and concrete walkways.
- Mature trees were observed in the centre of the Site and along the northern perimeter boundary. Observed vegetation appeared to be in good health with no evidence of dieback at the time of observation.
- The Site was previously located in a low-lying swamp area and built up overtime. Surface soils on the Site appeared to be primarily topsoil placed over fill material consisting of Gravelly Sands, fine to medium grained, brown to pale brown in colour, fine to medium sized subangular gravels. There were no fill mounds observed at the Site at the time of the walkover.
- A concrete lined stormwater drain, a tributary of Cottage Creek, was located 15m south west of the Site. The stormwater drain was known to flood in periods of heavy rainfall.
- A ground keeper shed located in the south-western corner of the Site was utilised to store approximately 70 Litres of Unleaded Petroleum (ULP) and other household chemicals. Chemicals observed include pesticides, methylated spirits, paint, wood stains, WD40 and domestic cleaning fluids. Chemicals were stored on open shelving and a concrete floor with no bunding and ranged in size from 250ml to 30-litre containers. There was no visual evidence of spills or leaks.
- No soil staining, potential asbestos containing materials or malodorous odours were noted during the site walkover.

4.7. Interview

Interviews were held with the following:

Bill - Groundskeeper (4 years' service)

- Bill stated he had been involved with the Site for a period of four years as a groundskeeper for Newcastle Grammar School.
- Stated he had not witnessed significant spills or evidence of widespread contamination since commencing employment at the Site. He stated that the use of pesticides had been on grassed vegetation across the Site and had been undertaken since starting the role.
- Chemicals were stored in the ground keepers shed located in the south-west section of the Site. Pesticides, paint and ULP was stored for machinery and maintenance purposes only.
- He was not aware of significant contaminating events that may have affected the Site in the past.

4.8. Summary of site history

A site history review was undertaken as part of the PSI, and included:

- The Site was part of the Agricultural Company of Australia and or used by graziers up until 1947.
- From 1947 it was used as an Education facility, firstly as Crown Land then owned by Education Department
- Newcastle Grammar School has owned the Site from 1998.
- Prior to the 1950s the Site is likely to be low lying and undeveloped and used for agricultural purposes. The aerial photos indicate that between the 1950s and 1960s the Site was developed and likely imported fill was used to raise the site level;
- The Site was listed on the NSW EPA Contaminated Land Register or POEO Act register.
- The risk associated with nearby properties identified on the NSW EPA Contaminated Land Register or POEO public register was considered to be low.
- The Site was identified within an area of low occurrence of potential acid sulfate soils.
- The following area of environmental concern were identified:

- Potentially impacted fill of unknown origin.

4.9. Gaps in the site history

The following information sources were referred to for this assessment:

- NSW EPA.
- Planning certificate provided by AOD.
- Historical land title search conducted between 1847 and 2021.
- Aerial photographs and google earth images provided for the period between 1954 and 2021.
- Observations made in the field during the site walkover.

The observations made during the site walkover were generally consistent with the recent aerial photographs and the past use reported in the historical title report. Some uncertainty remains regarding the quantity and quality of imported fill materials.

5. Fieldwork

5.1. Investigation locations

Drilling of seven (7) boreholes (BH1 to BH7) using licensed drillers Terratest Pty Ltd, in the full-time presence of a Coffey Environmental Scientist was undertaken on the 15th January 2021. An additional three (3) boreholes were advanced by hand auger on the 18th January 2021.

Boreholes (BH1-BH6) were advanced using both solid flight auger and split tube sampling to a depth of about 2.0 metres below ground surface (m bgs) ensuring natural soils were intersected at each location. Boreholes BH7, BH8 BH9 and BH10 were terminated between depth ranges of 0.6 - 0.7m bgs.

The selected borehole soil sample locations are presented in Figure 2.

5.2. Sampling methodology

The field investigation works followed the methodology outlined below in Table 5.1.

Table 5.1: Soil sampling fieldwork procedure

Activity	Detail / Comments
Below Ground Service Clearance	Dial-Before-You-Dig (DBYD) service plans for the Site and surrounding area were reviewed prior to commencement of intrusive investigation works. Investigation locations were scanned by a suitably qualified and experienced underground services clearance sub-contractor using an electromagnetic detector.
Soil Sampling	Soil samples from seven (7) borehole locations (BH1 to BH7) were collected directly from split tube samples with the assistance of a drill rig. Soil samples from borehole locations (BH8 to BH10) were collected with the assistance of a hand auger. Samples were collected from near surface <0.3m bgs and 0.3 to 0.5m bgs targeting the fill soil profile and one collected in the natural (residual) material, where achievable.
Soil Logging	Soil samples were logged by a suitably qualified and experienced Coffey scientist in accordance with Coffey's relevant Standard Operating Practice (SOP), which is consistent with Section 7.3, Field Description of Soils, in Schedule B2 of the ASC NEPM 1999, 20130. Presence or absence of anthropogenic material and contamination (i.e. odours or staining) is recorded on the geological logs which are presented in Appendix C.
Soil Screening	Soil samples were screened in the field for the presence of ionisable volatile organic compounds (VOCs) using a Photoionization Detector (PID) fitted with a 10.6eV lamp. The PID was bump tested and fresh air calibrated at the start of each day. Calibration certificates are presented in Appendix D. Headspace screening results are recorded geological logs presented in Appendix C.

Activity	Detail / Comments
Sample Handling and Transportation	Sample collection, storage and transport were in general accordance with Coffey's SOP. Soil samples were placed into laboratory prepared and supplied glass jars, fitted with Teflon lined seals to limit possible volatile loss. Sample jars were filled to minimise headspace. Separate samples for asbestos and ASS analysis were collected and placed in double zip lock bags. The samples were placed into ice chilled coolers and dispatched to NATA accredited laboratories for analysis under chain of custody (CoC) control. CoC's are included with the laboratory certificates in Appendix J.
QA/QC Samples	To measure the accuracy and precision of the data generated by the field and laboratory procedures for this assessment, Coffey collected and analysed the following quality assurance / quality control (QA/QC) samples: • Two intra-laboratory duplicate soil samples. • Two inter-laboratory triplicate soil samples. • One trip spike sample was included in the transfer of soil samples from Coffey to the laboratory, to assess specific semi-volatile and volatile recoveries. • One trip blank sample was included in each batch of samples to assess whether any contamination may have been introduced to the samples during shipping and field handling procedures.

5.3. Analytical Schedule

Soil samples were analysed by Eurofins | MGT at Lane Cove West (primary laboratory), and ALS in Smithfield (secondary laboratory). Both laboratories are NATA accredited for the analytes selected.

A selection of primary soil samples was submitted for laboratory analysis for a suite of chemicals of potential concern (COPC) as summarised in Table 5.2. Samples were selected to achieve characterisation of the soils at the Site and targeting indicators of contaminations such as soil staining, noxious odours or elevated PID readings measured during sampling.

Table 5.2: Summary of soil COPCs

Chemical of Concern	No. Primary Soil Samples
Heavy metals	10
TRH	10
BTEX	10
PAH	10
Asbestos (Presence / Absence)	10

Notes: Heavy metals (arsenic, cadmium, chromium (IV), copper, lead, mercury (inorganic), nickel, zinc), TRH= total recoverable hydrocarbons, BTEX = benzene, toluene, ethylbenzene, xylenes, PAH= Polycyclic aromatic hydrocarbons.

5.4. Acid Sulfate Soils

Eighteen (18) soil samples were collected in double zip-locked bags from the selected locations for field screening. Results of the field screening are presented in Table LR5 (Appendix B).

Six samples were selected for laboratory analysis using the chromium reducible sulphur suite. Samples were collected from selected borehole locations (GBH02 and GBH03) during the geotechnical investigation.

6. Assessment Criteria

Assessment criteria for the investigation were selected for relevance to the future land use of the proposed development with Health Investigation Level (HIL - A) selected. HIL – A land use described as 'residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake), also includes childcare centres, preschools and primary schools).

The criteria presented below are intended to apply as Tier 1 risk assessment criteria based on certain site-specific characteristics. Where concentrations of a contaminant exceed the generic assessment criteria, then further consideration of the specific exposure pathway is required which may warrant further investigation, assessment or the development of a strategy to mitigate the potential risks identified.

6.1. Soil

6.1.1. Health and Ecological Investigation and Screening Levels

Health and ecological investigation and screening levels for soil presented in Schedule B1 of the ASC NEPM are generally used when selecting assessment criteria to evaluate risk to human health and ecosystems resulting from site contamination.

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) are applicable for assessing human health risk via relevant exposure pathways. HILs were developed for a broad range of metals and organic substances. These are generic to all soil types and apply generally to a depth of 3m below the soil surface for residential sites.

Ecological Investigation Levels (EILs) are associated with selected metals and organic compounds and have been developed for assessing risk to terrestrial ecosystems under residential, open space and commercial/industrial land use scenarios. They apply to the top 2m of accessible soil, which corresponds to the root zone and habitation zone of many species.

Health screening levels (HSLs) have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation after vapour intrusion into indoor air and direct contact with soil and groundwater. These HSLs depend on general soil type (sand, silt and clay mixture), building configurations and land use scenarios.

Similarly, ecological screening levels (ESLs) have been developed for selected petroleum compounds and fractions and are applicable for assessing risk to terrestrial ecosystems. The ESLs broadly apply to coarse and fine-grained soils under various land use scenarios and are applicable to the top 2m of accessible soil.

6.1.2. Health-based criteria

The intended future use of the Site is considered consistent with the "Residential A" exposure scenario described in Schedule B7 of the ASC NEPM (2013) which allows for garden / accessible soils and includes dwellings with home grown produce <10% fruit and vegetable intake, (no poultry) also includes childcare centres, preschools and primary schools.

Chemicals with sufficient volatility to pose potential health risks via vapour inhalation pathway; namely TRH F1 and F2 fractions, BTEX and naphthalene concentrations were compared to the soil Health Screening Levels (HSLs) for vapour intrusion applicable to high density residential uses (i.e. HSL A & HSL B) listed in Table 1A(3) in Schedule B1 of the ASC NEPM.

The adopted screening levels apply to a sandy soil.

The HILs for heavy metals, PAH, pesticides and PCBs in soils are selected from relevant values in Table 1A (1) in Schedule B1 of the ASC NEPM. Adopted values for health-based criteria are summarised in Table 6.1.

Table 6.1: Summary of Health Investigation Levels (HILs) in Soil

Analyte	HILs for Residential A (mg/kg)
Arsenic (total)	100
Cadmium	20
Chromium (VI) ¹	100
Copper	6,000
Lead	300
Mercury (inorganic)	40
Nickel	400
Zinc	7,400
Carcinogenic PAHs as Benzo(a)pyrene TEQ ²	3
Total PAHs	300

¹ Laboratory Total Chromium results (or Total Chromium minus Chromium III) will be assessed against the HIL for Chromium VI as an initial screening assessment.

² TEQ = Toxicity Equivalent Quotient

The HSLs for TRH, BTEX and naphthalene in soils are summarised in Table 6.2.

Based on the dominant soil texture, HSLs for sandy soils have been adopted.

Table 6.2: Summary of Health Screening Levels in Soil

Chemical	HSL A & B – Residential (for sandy soils) ¹ (mg/kg)			HSL-A Direct Contact ² (mg/kg)	Intrusive Maintenance Worker ^{2/3} (mg/kg)
	0m to <1m	1m to <2m	2m to <4m		
Benzene	0.5	0.5	0.5	100	120,000 / NL
Toluene	160	220	310	14,000	85,000 / NL
Ethylbenzene	55	NL	NL	4,500	130,000 / NL
Xylenes	40	60	95	12,000	29,000 / NL
Naphthalene	3	NL	NL	1,400	1100 / 77
F1 (TPH C ₆ -C ₁₀ – BTEX)	45	70	110	4,400	82,000 / NL
F2 (TPH >C ₁₀ -C ₁₆ – Naphthalene)	110	240	440	3,300	62,000 / NL

Notes:

NL: non-limiting (i.e. contaminant is not considered to pose a risk to human health through vapour inhalation regardless of concentration).

Soil type is assumed to be clayey soils based on previous investigation.

1. Table 1A (3) – Soil Health Screening Levels for Vapour Intrusion (NEPC, 2013)

2. Table B4 - Soil Health Screening levels for Direct Contact for future resident (CRC CARE, 2011)

3. Table B3 – Soil Health Screening Levels for Vapour Intrusion (Intrusive Maintenance Worker) (CRC CARE, 2011)

6.1.3. Ecological Investigation and Screening Levels

To assess the impact on ecosystems including site vegetation from contamination within the upper 2m of the subsurface, the ASC NEPM presents Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for different land uses (e.g. areas of ecological significance, urban residential/public open space, commercial).

The EILs derived for heavy metals in soils are summarised in Table 6.3.

Table 6.3: Summary of EILs in Soil

Chemical	Urban Residential / Public Open Space (mg/kg)		
	Contaminant Limit	Ambient Concentration ⁽⁴⁾	EIL
Arsenic	100	5	110
Chromium	190 ⁽¹⁾	13	200
Copper	95 ⁽²⁾	28	120
Lead	1,100	163	1,270
Nickel	30 ⁽²⁾	5	40
Zinc	230 ⁽³⁾	122	350
Naphthalene	170	-	170

¹ Based on a clay content 17%.

² Based on a cation exchange capacity of 5.7cmol/kg typical of a granular soil with minor clay.

³ Based on a cation exchange capacity of 5cmol/kg typical of a granular soil with minor clay and a pH of 5.6

The ESLs for TRH, BTEX and benzo(a)pyrene in soils from Schedule B1 in the ASC NEPM are summarised in Table 6.4. ESLs for sandy soils have been adopted.

Table 6.4: Summary of ESLs in Soil

Chemical	ESL – Urban Residential and public open space (for fine grained soils) (mg/kg)
F1 C ₆ -C ₁₀	120
F2 C ₁₀ -C ₁₆	120
F3 >C ₁₆ -C ₃₄	1300
F4 >C ₃₄ -C ₄₀	5600
Benzene	65
Toluene	105
Ethylbenzene	125
Xylenes	45
Benzo(a)pyrene	0.7

6.1.4. Management Limits

In accordance with Section 2.9 of Schedule B1 of the ASC NEPM, consideration of Management Limits for petroleum hydrocarbons has been included to assess the potential for accumulation of explosive vapours, the potential risk to buried infrastructure, or the formation of phase separated hydrocarbons (PSH).

A summary of the adopted management limits for this site is provided below in Table 6.5.

Table 6.5: Summary of Site Management Limits

Chemical	Soil Type	Residential, parkland and public open space (mg/kg)
F1: TRH C ₆ -C ₁₀	Fine	700
F2: TRH C ₁₀ -C ₁₆	Fine	1,000
F3: TRH C ₁₆ -C ₃₄	Fine	2,500
F4: TRH C ₃₄ -C ₄₀	Fine	10,000

6.2. Asbestos

Analytical results for soil or suspect ACM will be either assessed as present or absent. Where samples are reported to have asbestos present, additional assessment works would be triggered with analytical results compared against asbestos Health Screening Levels as presented in Table 6.6.

Table 6.6: Summary of Health Screening Levels for Asbestos in Soil

Form of Asbestos	Health Screening Level (w/w)
	Residential - HSL -A
Bonded ACM	0.01%
FA and AF	0.001%
All forms of asbestos	No visible asbestos for surface soil

ACM: Asbestos Containing Material, FA: Friable Asbestos, AF: Asbestos Fines

6.3. Acid Sulfate Soils

The assessment criteria adopted to assess the potential for acid sulfate soils was derived from the NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC) (1998) Acid Sulfate Soil Manual and the *National Strategy for the management of Coastal Acid Sulfate Soils (2000)*.

A summary of the assessment criteria for acid sulfate soils is listed in Table 6.7.

Table 6.7: Summary of Acid Sulfate Soil action criteria

Material Type	Approximate Clay Content (%)	ACTION CRITERIA (>1,000 TONNES)	
		Sulfur Trail (%S)	Acid Trail (mol H ⁺ / tonne)
Coarse Texture	<5	0.03	18
Fine Texture	>40%	0.1	62

7. Data Quality Objectives

Data Quality Objectives (DQOs) have been developed in accordance with the seven-step process outlined within the Appendix C to Schedule B2 in ASC NEPM and are outlined in Table 7.1.

Table 7.1: Data Quality Objective summary

Step 1: State the Problem	The Site will be re-developed for education purposes (primary school). There has been imported fill of unknown quality and quality used at the Site that could impact human and ecological receptors during and after re-development.
Step 2: Identify the Decision	Decision Questions: - What is the nature and extent of contamination on the Site? - Does the contamination, if identified, pose an unacceptable risk to human health and the environment in the context of continued primary school land use? - Are there any direct exposure pathways? - Is there a potential risk for offsite migration of contamination?
Step 3: Identify Inputs to the Decision	The following inputs to the decision are: - What media, that is, soil should be assessed? - Is an adequate number of sampling locations in accordance with the requirements detailed within the NSW EPA (1995) Contaminated Sites: Sampling Design Guidelines? - Is sampling on judgemental pattern suitable for the project objectives? - Do the number of samples analysed for each chemical of concern provide adequate data set to complete a statistical appraisal? - Does the data adequately represent the conditions on site? The information inputs required to assess compliance within the NSW EPA (2017) Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme include: - Quality Assurance/ Quality Control (QA/QC) documentation and review of data quality indicators (DQIs). - Data to be collected by Coffey including field observations and laboratory analytical results. - Assessment criteria outlined in this document (see Section 6). Applicable to NSW EPA guidelines. - Environmental variables to be measured. - Concentrations of chemicals of concern within soil at the Site. Media to be collected: - Fill materials; and - Natural soil material.
Step 4: Define the Boundaries of the Study	The study boundary is defined as proposed development locations within the 127 Union Street, Cooks Hill NSW (Lot 102, DP 861562) premises which have a combined area of approximately 3,300m². The assessment boundary and proposed sample locations is outlined in Figure 2 of Appendix A. The vertical site boundary is dependent on the depth of fill and natural soil at each of the proposed sample locations. It is anticipated that the vertical boundary will be approximately 1.0 to 2.0 mbgs.
Step 5: Develop a Decision Rule	The decision rule for soil for each chemical/ layer to assess the suitability of the Site will be as follows: - QA/QC assessment and DQIs indicates that the data is usable. - Where contaminant concentrations for each sample are below the adopted investigation levels, then no further assessment/ remediation is required with respect to that chemical/ media/ area.

	Where contaminant concentrations are reported above the adopted investigation levels, further investigation and/or risk assessment may be required. If identified contamination poses an unacceptable risk to human health and/or the environment, then additional assessment, remediation and/or implementation of appropriate controls would be required to reduce risk to acceptable levels.
Step 6: Acceptable Limits on Decision Error	There are two types of decision errors: - Sampling errors, which occur when the samples collected are not representative of the conditions within the investigation; and - Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction. These errors may lead the decision maker to make the following errors: - Deciding that the Site is not contaminated and, therefore the Site is suitable for redevelopment when it is not; and - Deciding that the Site is contaminated and, therefore, the Site is not suitable for redevelopment when it is not. The consequences of a type 2 error are less than a type 1 error and therefore we propose a greater limit on the type 2 error (approximately 80% probability). An assessment will be made as to the likelihood of a decision error being made based on the results of a QA/QC assessment and the closeness of the data to the assessment criteria. Additionally, statistical methods may be used, where applicable. The null hypothesis for this study is: - Contaminant concentrations at the Site are above the adopted investigation/ screening levels.
Step 7: Optimise the Design for Obtaining Data	Based on the previous Steps 1 to 6 of the DQO process, the optimal design for obtaining the required data is presented in the following sections.

8. Data Quality Indicators

The following Data Quality Indicators (DQIs) are based on the requirements detailed in Appendix C of Schedule B2 of the ASC NEPM and are outlined in Tables 8.1 to 8.5.

Table 8.1: DQI completeness

DQI	Field Considerations	DQI Criteria	Laboratory Considerations	DQI Criteria
Completeness	All critical locations were sampled	Samples were collected from all locations with no deviation from the sampling plan, without reasonable justification. If all locations are not sampled, further field works may be required to ensure the required information is obtained.	All critical samples analysed according to sampling plan.	Samples were analysed for COPCs (TRH, BTEX, PAH, heavy metals and asbestos). Additional laboratory analysis will be required should requested analysis not be completed.
	All samples collected	Samples were collected in accordance with Coffey's SOPs during the assessment. If a deviation from the sampling plan occurs additional field works may need to be undertaken to obtain critical results.	All identified COPCs identified.	As above.
	Standard Operating Procedures (SOPs) appropriate and complied with	No departure from Coffey's SOPs without reasonable justification. Any deviation from the SOPs should be justified and reasonable, otherwise additional field works may need to be undertaken to obtain reliable results.	Appropriate methods and LORs	Samples were analysed by laboratories NATA accredited, for the analyses to be performed and appropriate methods will be used. LORs will be less than assessment criteria. Should LORs be equal to or above the assessment criteria additional laboratory analysis may be required.
	Experienced sampler	Experienced Coffey Environmental Scientists conducted the sampling. If an environmental scientist conducts fieldwork without the relevant project experience, then additional sampling may be required to replace compromised results.	Sample documentation complete	Chain of custody's (COCs) were returned, signed and dated by laboratory. NATA endorsed laboratory certificates were completed in accordance with Schedule B3 of the ASC NEPM. Field logs were completed in accordance with Coffey SOPs. Coffey will ensure relevant COCs and NATA endorsed laboratory certificates are provided or additional testing will be required.

	Documentation correct	Samples were handled and transported under appropriate chain of custody (COC) documentation. Coffey will keep original COC documentation should documentation be lost during transportation. Sample Receipt Notifications (SRN) from the laboratory were reviewed to assess that samples are received cool and in good condition. Should SRN details indicate that samples were not received in good condition, consideration to additional sampling may be required in order to ensure data is reliable. Current calibration certificates for the PID will be provided and the PID instrument were bump tested on a daily basis, with records included as part of the assessment. The equipment supplier will provide equipment that is accompanied by current calibration certification and if such documentation is missing, the equipment will not be used.	Sample holding times were complied with	Samples will be analysed within holding times specified in Schedule B3 of the ASC NEPM. Additional sample collection may be required if collected samples are outside the appropriate holding times.
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Table 8.2: DQI Comparability

DQI	Field Considerations	DQI Criteria	Laboratory Considerations	DQI Criteria
Comparability	Same SOPs used on each occasion	Coffey SOPs were implemented. Any change in SOPs used should be justified and reasonable, otherwise additional field works may need to be undertaken to obtain comparable results.	Same sample analytical methods used.	The same laboratories and test methods were used for analysis of all samples. The primary and/or secondary laboratory should be selected so that any differences in preparation and/or analytical methods do not adversely affect comparability of results.

	Experienced sampler	Experienced Coffey Environmental Scientists conducted the sampling. If different environmental scientists conduct similar sampling activities, then the scientist should review field notes for previous sampling activity so that comparability of results is not compromised.	Same sample LORs	As above
	Climatic conditions (temperature, rainfall, wind etc.)	Sampling for this work will be completed when necessary. Climatic conditions are not expected to cause issues for comparability of data. Should adverse climatic conditions inhibit the data quality, works will cease and re-commence once acceptable sampling conditions return.	Same laboratories	As above
	Same types of samples collected	Samples were collected in the appropriate laboratory supplied container specific to the analyses performed. Samples collected in containers unsuitable to the selected analyses, may be discarded and additional sample collection may be undertaken.	Same units	As above

Table 8.3: DQI Representativeness

DQI	Field Considerations	DQI Criteria	Laboratory Considerations	DQI Criteria
Representativeness	Appropriate media sampled according to sample plan	Soil samples were collected and analysed in accordance with Coffey's SOPs. If a deviation from the sampling plan occurs additional field works may need to be undertaken.	Appropriate media sampled according to sample plan	Collected samples to be analysed by NATA accredited laboratories. If analysis is completed which does not meet NATA accreditation standards, additional sampling and/or testing by a NATA accredited laboratory will be required.
	All media identified in sample plan	All media (soil) collected and analysed in accordance with Coffey's SOPs. If a deviation from the sampling plan occurs		

		additional field works may need to be undertaken.		
	SOPs appropriate and complied with	Coffey's SOPs were implemented. If a deviation from the SOPs occurs additional field works may need to be undertaken.	Analysis of field duplicates	Laboratory duplicates will be analysed in general accordance with ASC NEPM. Where laboratory duplicates are not analysed in accordance with the ASC NEPM, additional laboratory testing may be requested if this difference is not able to be justified.

Table 8.4: DQI Precision

DQI	Field Considerations	DQI Criteria	Laboratory Considerations	DQI Criteria
Precision	SOPs appropriate and complied with	Coffey SOPs were implemented. If a deviation from the SOPs occurs additional field works may need to be undertaken if precision of results is unacceptable.	Analysis of laboratory duplicates	RPD values for inter-laboratory duplicates and recovery of matrix spikes are within acceptance limits. Where RPD values or recovery limits for matrix spike are outside the acceptance limits, additional laboratory testing may be requested if this difference in not able to be justified.
	Analysis of field duplicates	As for laboratory considerations	Analysis of field duplicates	Duplicates will be analysed at a frequency of: 1 intra laboratory duplicate per 10 primary sample collected. 1 inter laboratory duplicate per 10 primary sample collected. RPDs were calculated and compared to relevant acceptance criteria. 30% for concentrations more than 10 times the LOR and 50% for concentrations less than 10 times the LOR (Standards Australia 1997) Where RPDs don't meet the acceptance criteria, additional analysis would need to be considered if justification cannot be made with respect to the suitability data has for the inclusion in the assessment.

Table 8.5: DQI accuracy

DQI	Field Considerations	DQI Criteria	Laboratory Considerations	DQI Criteria
Accuracy	SOP appropriate and complied with	Coffey SOPs were implemented If a deviation from the SOPs occurs additional field works will need to be undertaken.		
	Rinsate sample	Where reusable sampling equipment is utilised (if any) a rinsate sample will be collected using laboratory supplied distilled water. If rinsate sampling is not completed as part of the assessment, justification will be required, or an additional round of sampling will be required.	Rinsate sample and field blanks	A laboratory prepared trip blank will be included for each sample set (i.e. esky) where volatile compounds are requested for analysis (as defined in AS4482.2-1999 and Schedule B2 in the ASC NEPM. Analysis of the trip blank included a TRH F1 and BTEX. - Justification for the omission of trip blanks and/or additional assessment may be considered. - TRH or BTEX detections would be required.
	Trip Spike and blanks	Trip spike and blanks prepared by the laboratory were carried into the field and be transported with samples to the laboratory. If trip spike or blanks are excluded as part of the assessment, justification will be required, or an additional round of sampling will be required.	Method blank	Method blanks are analysed as recommended in Schedule B3 of the ASC NEPM. Results to be less than LOR. Where method blanks are in excess of the LORs, justification for the use of such data will be required or additional analysis will need to be considered.
			Laboratory duplicate and Matrix spike	RPD values for laboratory control duplicates and recovery of matrix spikes are within acceptance limits. Where RPDs and matrix spikes do not meet acceptance limits, justification for the use of such data will be required or additional analysis may need to be considered.

9. Quality Assurance/ Quality Control

The following QA/QC assessment addresses data completeness, comparability, representativeness, precision and accuracy based on field and laboratory considerations and the processes for assessment of data quality provided in Section 19 (Appendix C) of Schedule B2 Guideline on Site Characterisation of the ASC NEPM.

9.1. Field QA/QC

QA/QC procedures implemented for this project included:

- Sampling performed by qualified Coffey environmental professionals in accordance with Coffey's SOPs which are based on industry accepted protocols for environmental sampling and are consistent with Schedule B2 of the ASC NEPM.
- The following intra-laboratory (blind duplicate) and inter-laboratory (split duplicate) samples were collected and submitted for laboratory analysis as listed in Table 9.1.

Table 9.1: Summary of Field Duplicate Samples

Primary Sample	Sample Medium	Blind Duplicate	Split Duplicate
BH1-0.0-0.2 (15/01/21)	Soil	QC1	QC2
BH8-0.0-0.2 (18/01/21)	Soil	QC3	QC4

As part of the assessment 20 Primary soil samples were selected for analysis.

Two field duplicate and two split duplicate QC samples were analysed from soil samples. In summary, these duplicate samples were completed in accordance with the 1 in 20 sample rates in accordance with Coffey's SOPs and recommendations detailed within Section 8.2 of Australian Standard (AS 4482.1-2005) *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds*.

Calculated RPD values from collected primary, blind duplicate and split duplicate QC samples for soil, are listed in Table LR3 of Appendix B.

A review of soil QA/QC results generally reported RPDs below the control limits with the exception of two (2) exceedances in sample pair (BH1-0.0-0.2 /QC1) including Mercury (100%) and Nickel (64%).

Sample pair BH1-0.0-0.2 /QC2 reported three (3) RPD exceedances, with Lead (51%), Mercury (100%) and Nickel (57%) above the control limits.

Sample Pair BH8-0.0-0.2 / QC4 reported four (4) RPD exceedances, with Fluoranthene (77%), Phenanthrene (67%), Pyrene (88%) and Total PAHs (132%).

The measured RPD exceedances are likely due to the heterogenous nature of the fill material as observed during sampling (gravelly sand and fine to medium sub-angular gravels).

A review of Trip Blank (TB) and Trip Spike (TS) samples showed that concentrations were reported to be less than the laboratory LOR. Therefore, the likelihood that cross contamination occurred during transportation of samples from site to the laboratory is unlikely. Trip Blank and Trip Spike results are presented in Table LR4 Appendix B.

9.2. Data quality assessment

Based on an assessment of the field and laboratory QA/QC information, Coffey considers that the data obtained is representative of subsurface conditions at the sampling locations at the time of sampling. Overall, it is assessed that the results are acceptable for the purposes of this investigation.

10. Results

10.1. Subsurface Conditions

Subsurface conditions are summarised in Table 10.1.

Table 10.1: Sub surface conditions

Material / Origin	Depth to Base of Unit (m bgs)	Thickness of Unit (m)	Material Description
Topsoil (Fill)	0.0 to 0.3	0.3	Fill material was encountered in each borehole. A layer of fresh grassed vegetation 0.0-0.1m bgs was observed covering surface soils across the Site. Fill material typically comprised a consistent layer of Gravelly SAND to Sandy GRAVEL: fine to medium grained, brown to pale brown in colour, fine to medium sized subangular gravels trace to some rootlets. No odour, soil staining or ACM was observed within the topsoil (fill) layer at the Site.
Fill (Variable)	0.2 to 3.1	2.9	Highly variable unit includes the following: SAND to Silty SAND and Clayey SAND: fine to coarse grained, pale brown/ grey brown dark brown and black, trace to with some gravel including coal reject material, bricks Sandy CLAY: medium plasticity, orange mottled red and white, with fine to medium sand CLAY: high plasticity yellow and mottled grey SAND: fine to medium grained, pale brown/ pale yellow/ grey, some fine to medium grained subangular gravels No odour, soil staining or ACM was observed within the fill soil profile.
Alluvial	3.1 to 4.2	undefined	Swamp Deposits* - PEAT: dark grey to black, trace of fine to medium sand and rootlets, very soft to soft consistency

* Description as per Coffey Geotechnical Report (754-NTLGE282007-AD 19th February 2021).

10.2. Field Screening

Soil samples were screened for presence of volatile hydrocarbons using a PID. The PID readings were reported between 0.0 ppm and 13.3 ppm, indicating that volatile hydrocarbons were unlikely to be present at reportable concentrations.

Individual PID readings are reported on the geological logs presented in Appendix C.

10.3. Soil Results

Soil analytical results were compared to the Site assessment criteria and are provided in Table LR1 (Appendix B). Soil analytical results for preliminary waste classification are provided in Table LR2 (Appendix B). Copies of the laboratory reports are provided in (Appendix J). Sampling locations are shown on Figure 2.

10.3.1. Health-based Investigation and Screening Levels

Soil samples reported chemical concentrations less than the adopted health-based investigation and screening levels in samples analysed with the exception of Benzo(a)pyrene (BH4-0.0-0.2, 11mg/kg) and (BH4-0.3-0.5, 48mg/kg) reported above the HIL-A criteria (3mg/kg).

Soil sample BH4-0.3-0.5 reported Total PAHs (386.6mg/kg) above the HIL-A criteria (300mg/kg)

Sample BH7-0.5-0.6 reported Lead (380mg/kg) above the HIL - A criteria (300mg/kg). A 95% UCL calculation was undertaken on this sample. Following statistical appraisal, sample BH7-0.5-0.6 reported 143mg/kg, below the adopted HIL criteria of 300mg/kg.

Due to the reported high concentrations of Benzo(a)pyrene (48mg/kg) and Total PAHs in sample BH4-0.3-0.5, additional analysis of the sample was requested to verify the high concentrations. Re-analysed sample (BH4-0.3-0.5) reported an increase in Benzo(a)pyrene (59mg/kg) and Total PAH (498.6mg/kg) concentrations, respectively.

A summary of health investigation and screening level chemical concentrations is presented in Table LR1 (Appendix B).

10.3.2. Ecological Investigation and Screening Levels

Soil samples reported chemical concentrations less than the adopted ecological investigation and screening levels with the exception Zinc reported to exceed the adopted EIL Criteria (290mg/kg) in samples BH4-0.3-0.5 (380mg/kg) and BH6-1.6-1.9 (730mg/kg), respectively.

Re-analysed sample BH4-0.3-0.5 reported Copper (1000mg/kg) to exceed the adopted EIL criteria (120mg/kg).

A summary of ecological chemical concentrations is presented in Table LR1 (Appendix B).

10.3.3. Management Limits

Soil samples reported chemical concentrations below the adopted management limits.

A summary of Management Limit chemical concentrations is presented in Table LR1 (Appendix B).

10.3.4. Asbestos

Six (6) selected soil samples were analysed for the presence/absence of asbestos fibres in soil.

Each sample analysed reported no presence of asbestos in soil. A summary of asbestos in soil results is presented in Table LR1 (Appendix B).

10.3.5. Acid Sulfate Soils - Field Screening

The eighteen samples were field screened at a NATA accredited laboratory in Smithfield, NSW, the results of the screening are summarised below.

- In a mixture of 1:5 distilled water a pH between 6.3 and 8.8 was recorded. A pH less than or equal to 4 is likely to indicate the presence of ASS.

- A pH_{FOX} ranging between 1.3 and 6.8 pH units was reported in a solution of hydrogen peroxide and soil. A final pH of less than 3.5 can be indicative of ASS.
- A total pH drop was in the range of 1.1 to 7.1 pH units. A drop of 1 pH unit, plus rise in temperature, effervescence, colour and odour factors can be indicative of ASS.
- Strong to extreme reactions were reported during the screening process.

The field screening results indicated that there was a risk of ASS being encountered at depths greater than about 3m bgs.

10.3.6. Chromium Reducible Sulfur

Six samples were selected for further Chromium Reducible Sulfur (CRS) analysis, the samples collected were (GBH02-2.5m, GBH02-4.0m, GBH02-10m, GBH03-3.0m, GBH03-4.5m and GBH03-12m).

Table 10.2 below outlines the results of the Chromium Suite analysis of selected samples.

10.2: Summary of Acid Sulfate Soil results.

Sample ID	Depth (mbgs)	Laboratory Results				
		pH in KCL	TAA (moles/tonne)	% SCR	Net Acidity (moles/tonne)	Liming Rate (kg CaCO ₃ /tonne)
GBH02	2.5	7.1	<2	0.017	<10	<1
GBH02	4.0	5.7	6	0.201	132	10
GBH02	10.0	5.3	9	0.063	48	4
GBH03	3.0	5.4	9	0.016	19	1
GBH03	4.5	5.0	50	0.054	84	6
GBH03	12.0	5.6	7	0.008	12	<1
Action Criteria		<i>N/A</i>	18	0.03	18	<i>N/A</i>

Exceedances of the adopted criteria for coarse grained soils >1000tonnes of material were present at locations GBH02 and GBH03 at depths greater than 3.0m bgs. A liming rate of 10kg of CaCO₃/ tonne of soil disturbed was calculated by NATA accredited laboratory ALS.

Results of the chromium suite analysis are presented in Table LR5 (Appendix B).

10.3.7. Statistical Appraisal

A statistical appraisal was conducted using ProUCL 5.1 on heavy metal analyte Lead reported in excess of the HILs. A summary of the results from the statistical appraisal is provided in Table 10.3.

Table 10.3: Summary statistical appraisal for HIL exceedance

Analyte	HIL	Max	Mean	SD	95% UCL	Single sample >250% of HIL	SD <50% of HIL
Lead	300	380	66.41	92.34	142.9	No	Yes

UCL: Upper confidence limit

Based on the results of the statistical appraisal heavy metals analyte lead reported 95% UCL of the mean below the HILs within fill.

Statistical documentation is provided in Appendix K.

11. Preliminary Conceptual Site Model

11.1. Sources of Contamination and Associated Chemicals of Potential Concern

Table 11.1: Potential Contamination Sources and COPCs

AEC	Potentially Contaminating Activity	COPCs	Likelihood of Contamination*	Comments
Whole Site	Potentially contains fill of unknown origin	Heavy metals, TRH, BTEX, PAH, Asbestos	Low to medium	Imported fill material historically placed to raise the site level.
Whole Site	Potential Acid Sulfate Soils	Potential ASS within natural soils below fill soil profile (>3m bgs)	Medium to high	ASS at depths greater than 3m bgs across the site

Metals - arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc; BTEX - Benzene, Toluene, Ethylbenzene and Xylenes; TRH - Total Recoverable Hydrocarbons; PAH - Polycyclic Aromatic Hydrocarbons; ASS - Acid Sulfate Soils.

11.2. Source Contamination, Transport Mechanisms, Pathways and Receptors

A summary of the potentially affected media, key potential receptors and transport mechanisms is presented in Table 11.2.

Table 11.2: Summary of Source Contamination, Transport Mechanisms, Pathways and Receptors

Primary Sources (COPCs)	Secondary Sources	Transport Mechanisms	Exposure Routes	Exposed Receptors
Potentially contains fill of unknown origin	Impacted fill and natural soils (about 3.0m bgs) from potential leaching of lead into natural soils/ and or groundwater	- Leaching from soil to groundwater - Surface water runoff - Fibre release to air	- Soil Ingestion - Dermal Contact with Soil - Outdoor dust inhalation - Ingestion of groundwater - Dermal contact with groundwater	- Site Users - On Site Workers - Maintenance Workers - Ecological – surface water, aquatic ecosystems, transitory wildlife

11.3. Key potential Exposure Pathways

Table 11.3: Summary of the key potential exposure pathways

Receptor/ Media	Exposure Pathway	Comment
Maintenance/ Construction Worker	Complete	There is a potential for workers conducting subsurface and surface disturbance to be exposed to unexpected finds of contamination via dermal contact, ingestion and inhalation pathways during development and maintenance works.

Current and Future Site Users	Potentially Incomplete	Unsealed surfaces may present a potentially complete pathway to dermal contact, ingestion and inhalation of soils and/ or dust fibers. Current laboratory data suggest low risk to human health. Pathway is considered incomplete following re-development and capping with building foundations
Ecological (surface water soil biota and transitory wildlife)	Complete	Current data indicates a potential risk to ecological receptors from fill soils. This risk should be eliminated following re development assuming the areas will be covered by building foundations and pavements. Surface water runoff has the potential to transport sediment containing COPCs from any unsealed surfaces during rainfall events. Given the distance to the nearest receptor a complete pathway could exist during periods of high rainfall.
Groundwater	Incomplete	Leaching of COPCs into groundwater. Fill quality beneath the Site would be similar to other nearby sites that have been raised to prevent flooding. Impacts to groundwater would be regional and unlikely site specific. Given the use of reticulated water in the area it is also unlikely that groundwater is re-used for domestic use and direct contact with the groundwater is considered unlikely during or following re-development. A complete pathway is therefore unlikely to exist.

12. Conclusions and recommendations

A site history review was undertaken as part of the PCA, and concluded:

- The Site was part of the Agricultural Company of Australia and or used by graziers up until 1947.
- From 1947 it was used as an Education facility, firstly as Crown Land then owned by Education Department
- Newcastle Grammar School has owned the Site from 1998.
- Prior to the 1950s the Site is likely to be low lying and undeveloped and used for agricultural purposes. The aerial photos indicate that between the 1950s and 1960s the Site was developed, and likely imported fill was used to raise the site level.
- The Site was not listed on the NSW EPA Contaminated Land Register or POEO Act register.
- The risk associated with nearby properties identified on the NSW EPA Contaminated Land Register or POEO public register was considered to be low.
- The Site was identified within an area of low occurrence of potential acid sulfate soils above about 3.0m depth.

The following data gap was identified following the desk study and site history review:

- Potentially impacted fill of unknown quality and quantity.

Ten boreholes were drilled across the Site and samples collected and analysed for a suite of chemicals of potential concern (COPC). The laboratory results showed concentrations of COPC below the adopted criteria for human health apart from one location BH4 at about 0.5m depth that contained polycyclic aromatic hydrocarbons (PAH) and Benzo a Pyrene (BaP) above the adopted criteria. There were some exceedances of the adopted ecological criteria for copper and zinc.

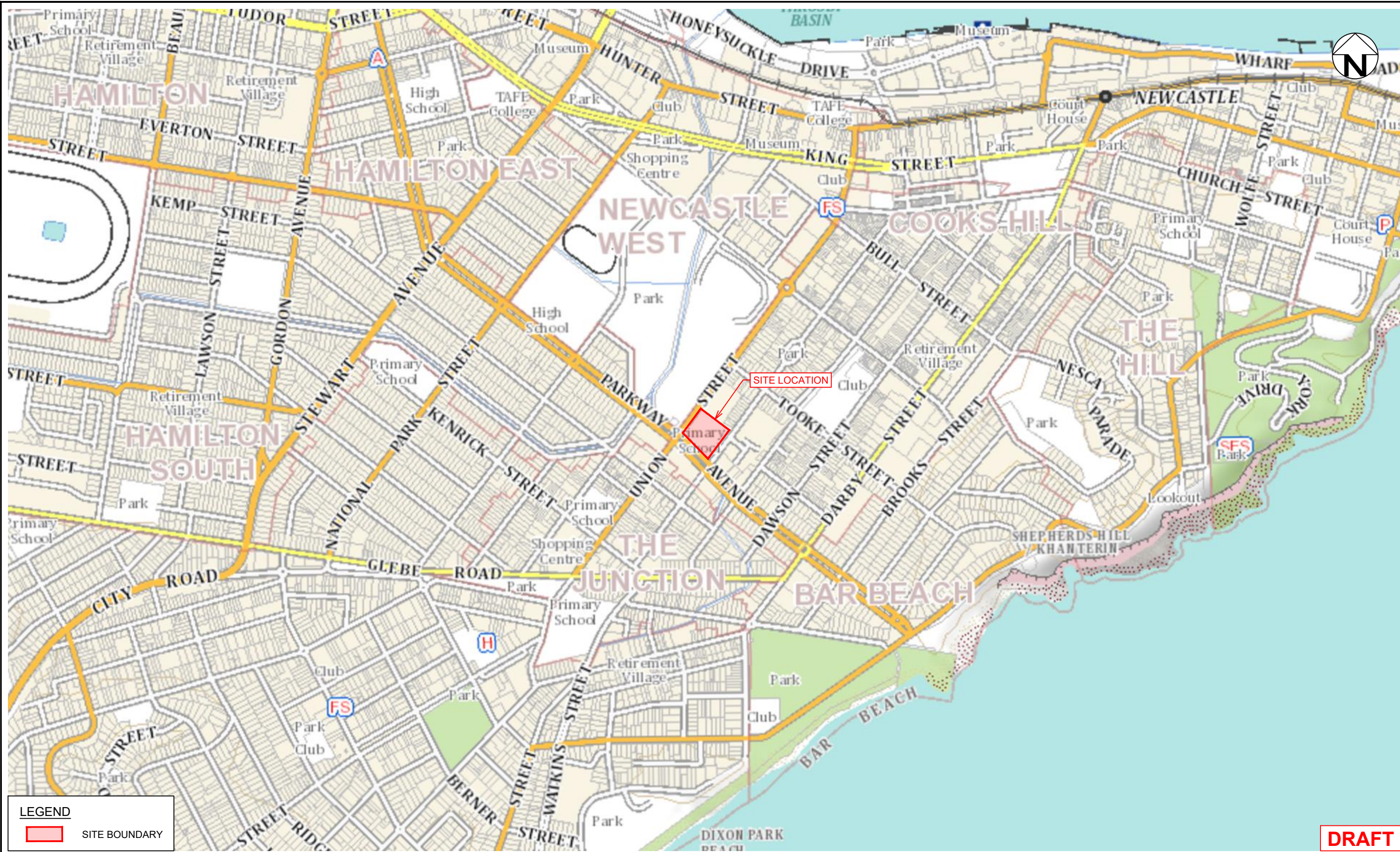
The Conceptual Site Model (CSM) indicated that there was a complete exposure pathway for construction workers from the identified contamination. Provided the majority of the fill remains below buildings and is not exposed on the site surface, a complete exposure pathway to ecological receptors is unlikely to exist post construction. Based on the findings from the site history review and fieldworks undertaken, it is concluded that the exceedances observed at borehole location BH4 will require further assessment in order to satisfy suitably for the proposed development.

The Site can be rendered suitable for the proposed development provide the following recommendations are implemented:

- **Delineation sampling of BH4** - additional investigation surrounding borehole BH4 to vertically and horizontally delineate the Polycyclic Aromatic Hydrocarbons (PAHs) and metal hotspot, reported at sample locations (BH04-0.0-0.2 and BH04-0.3-0.5). The advancement of Test Pits to an approximate depth of 1.0m bgs is recommended to visually observe the soil profile surrounding the hotspot. Delineation sampling will include validation analysis of samples collected from test pits for analytes PAH and metals.
- Based on the results of the ASS Assessment, completion of an **Acid Sulfate Soil Management Plan (ASSMP)** must be prepared to support this development.
- **Remedial Action Plan** Depending on the results of the additional assessment a Remedial Action Plan may be required to manage any contamination found.

This report should be read in conjunction with the attached *"Important Information about your Coffey Environmental Report"*.

Appendix A – Figures



LEGEND

SITE BOUNDARY

DRAFT

revision	no.	description			drawn	approved	date
	A	ORIGINAL ISSUE					

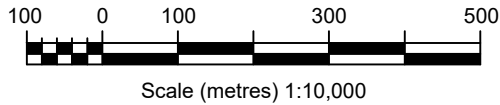


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drawn	SB/AW
approved	-
date	05/03/2021
scale	AS SHOWN
original size	A3



client:	APP CORPORATION LIMITED PTY LTD -NEWCASTLE GRAMMER SCHOOL		
project:	PRELIMINARY SITE INVESTIGATION NEWCASTLE GRAMMAR SCHOOL - PARK CAMPUS 127 UNION STREET, COOKS HILL, NSW		
title:	SITE LOCATION PLAN		
project no:	754-NTLGE282007-AE	drawing no:	FIGURE 1
		rev:	A

PLOT DATE: 5/03/2021 12:21:17 PM DWG FILE: P11 PROJECT: SYD-GEOTECHNICS 2 OTHER OFFICES: 9 ONTLC-GET54-NTLGE282007/CAD/754-NTLGE282007-AE.DWG



LEGEND

SITE BOUNDARY

● APPROXIMATE ENVIRONMENTAL BOREHOLE LOCATION (SHALLOW)

DRAFT

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE			

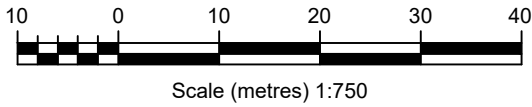


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drawn	SB/AW
approved	-
date	05/03/2021
scale	AS SHOWN
original size	A3



client:	APP CORPORATION LIMITED PTY LTD -NEWCASTLE GRAMMER SCHOOL		
project:	PRELIMINARY SITE INVESTIGATION NEWCASTLE GRAMMAR SCHOOL - PARK CAMPUS 127 UNION STREET, COOKS HILL, NSW		
title:	BOREHOLE LOCATION PLAN		
project no:	754-NTLGE282007-AE	drawing no:	FIGURE 2
		rev:	A

Appendix B - Lab Result Tables

								Field_ID	BH1-0.0-0.2	BH1-3.2-3.4	BH2-0.0-0.2	BH2-2.8-3.0	BH3-0.0-0.2	BH3-0.4-0.6	BH3-1.5-1.7	
								LocCode	BH1-0.0-0.2	BH1-3.2-3.4	BH2-0.0-0.2	BH2-2.8-3.0	BH3-0.0-0.2	BH3-0.4-0.6	BH3-1.5-1.7	
								Sampled_Date	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	
				NEPM 2013 HILs Residential A Soil	EIL/ESL	HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	HSL-A/B, 1 to <2m, Sand Soils for Vapour Intrusion	HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion								
Method	ChemName	Units	EQL													
Metals	Arsenic	mg/kg	2	100	100				<2	4.4	3.2	4.9	2.4	<2	9.8	
	Cadmium	mg/kg	0.4	20					<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	
	Chromium	mg/kg	5		480				8.2	7.8	13	9.1	10	7.4	30	
	Copper	mg/kg	5	6000	120				7.2	27	16	14	9.8	<5	<5	
	Lead	mg/kg	5	300	1100				8.4	37	56	20	24	5.5	6.1	
	Mercury	mg/kg	0.1	40					0.3	0.1	0.9	<0.1	<0.1	<0.1	<0.1	
	Nickel	mg/kg	5	400	50				<5	<5	5.3	5.5	<5	<5	<5	
	Zinc	mg/kg	5	7400	290				22	33	150	35	56	7.7	<5	
Inorganic	Moisture Content (dried @ 103°C)	%	1						6.7	20	14	16	9.6	6.4	16	
Organic	Naphthalene	mg/kg	0.5		170	3			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	F2-NAPHTHALENE	mg/kg	50				240		<50	<50	<50	<50	<50	<50	<50	
	C6 - C9	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	
	C10 - C40 (Sum of total)	mg/kg	100						<100	<100	<100	<100	<100	<100	<100	
	C6-C10 less BTEX (F1)	mg/kg	20			44	70		<20	<20	<20	<20	<20	<20	<20	
	C10-C16	mg/kg	50		120	110			<50	<50	<50	<50	<50	<50	<50	
	C16-C34	mg/kg	100		1300				<100	<100	<100	<100	<100	<100	<100	
	C34-C40	mg/kg	100		5600				<100	<100	<100	<100	<100	<100	<100	
	C6 - C10	mg/kg	20		120				<20	<20	<20	<20	<20	<20	<20	
PAH	Acenaphthene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	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	
	Benzo(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 (lower bound) *	MG/KG	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	3					0.6	0.6	0.6	0.6	0.6	0.6	0.6	
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5						1.2	1.2	1.2	1.2	1.2	1.2	1.2	
	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	
	Benzo[b+j]fluoranthene	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-c,d)pyrene	mg/kg	0.5						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Naphthalene	mg/kg	0.5			3			<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 PAHs	mg/kg	0.5	300						<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	TPH	C10 - C14	mg/kg	20						<20	<20	<20	<20	<20	<20	<20
C15 - C28		mg/kg	50						<50	<50	<50	<50	60	<50	<50	
C29 - C36		mg/kg	50						<50	<50	<50	<50	53	<50	<50	
C10 - C36 (Sum of total)		mg/kg	50						<50	<50	<50	<50	113	<50	<50	
Volatile	Benzene	mg/kg	0.1		65	0.5	0.5	77	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Ethylbenzene	mg/kg	0.1		125	57			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Toluene	mg/kg	0.1		105	160	220		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Xylene (m & p)	mg/kg	0.2						<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	Xylene (o)	mg/kg	0.1						<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	Xylene Total	mg/kg	0.3		45	40	60		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Result	NEPM 2013 HILs Residential A Soil															
Result	Environmental Investigation/Screening Levels - Urban Residential/public open space															
Result	Health Screening Level Residential A/B Landuse, 0 to <2m, Sand for															
Result	HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion															

				Field_ID	BH4-0.0-0.2	BH4-0.3-0.5	*BH4-0.3-0.5	BH4-1.4-1.6	BH5-0.3-0.5	BH5-1.0-1.2	BH6-0.0-0.2	BH6-1.6-1.9	BH7-0.0-0.2	BH7-0.5-0.6				
				LocCode	BH4-0.0-0.2	BH4-0.3-0.5	*BH4-0.3-0.5	BH4-1.4-1.6	BH5-0.3-0.5	BH5-1.0-1.2	BH6-0.0-0.2	BH6-1.6-1.9	BH7-0.0-0.2	BH7-0.5-0.6				
				Sampled_Date	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21	15-Jan-21				
				NEPM 2013 HILs Residential A Soil	EIL/ESL	HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	HSL-A/B, 1 to <2m, Sand Soils for Vapour Intrusion	HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion										
Metho	ChemName	Units	EQL															
Metals	Arsenic	mg/kg	2	100	100				3.9	13	12	<2	3.7	9.4	4.1	7.2	2	3.9
	Cadmium	mg/kg	0.4	20					<0.4	0.6	0.7	<0.4	<0.4	<0.4	<0.4	1.3	<0.4	<0.4
	Chromium	mg/kg	5		480				8.9	13	12	<5	7.2	14	7.8	14	<5	8.6
	Copper	mg/kg	5	6000	120				8.7	50	1000	<5	56	5.3	16	36	5.3	23
	Lead	mg/kg	5	300	1100				16	150	160	<5	12	17	18	180	7.6	380
	Mercury	mg/kg	0.1	40					<0.1	<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	0.9	<0.1	0.3
	Nickel	mg/kg	5	400	50				9.3	9.7	7.6	<5	<5	<5	<5	28	<5	10
	Zinc	mg/kg	5	7400	290				39	380	270	<5	21	8.7	61	730	28	220
Inorgar	Moisture Content (dried @ 103°C)	%	1						9.8	18	13	16	14	9.7	19	25	9.2	10
Organic	Naphthalene	mg/kg	0.5		170	3			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	F2-NAPHTHALENE	mg/kg	50				240		<50	71	<50	<50	<50	<50	<50	<50	<50	<50
	C6 - C9	mg/kg	20						<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C40 (Sum of total)	mg/kg	100						180	1481	1210	<100	<100	<100	<100	220	<100	280
	C6-C10 less BTEX (F1)	mg/kg	20			44	70		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10-C16	mg/kg	50		120	110			<50	71	<50	<50	<50	<50	<50	<50	<50	<50
	C16-C34	mg/kg	100		1300				180	1300	1000	<100	<100	<100	<100	220	<100	280
	C34-C40	mg/kg	100		5600				<100	110	210	<100	<100	<100	<100	<100	<100	<100
	C6 - C10	mg/kg	20		120				<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
PAH	Acenaphthene	mg/kg	0.5						1.4	2	2.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	1.8	6.1	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5
	Anthracene	mg/kg	0.5						3.7	6.6	13	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	2
	Benzo(a)anthracene	mg/kg	0.5						7.1	25	36	<0.5	<0.5	<0.5	<0.5	3.5	<0.5	7
	Benzo(a)pyrene	mg/kg	0.5		0.7				7.1	32	40	<0.5	<0.5	<0.5	<0.5	3.6	<0.5	7.1
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5						11	48	59	<0.5	<0.5	<0.5	<0.5	5.4	<0.5	11
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	3					11	48	59	0.6	0.6	0.6	0.6	5.4	0.6	11
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5						11	48	59	1.2	1.2	1.2	1.2	5.4	1.2	11
	Benzo(g,h,i)perylene	mg/kg	0.5						4.3	25	30	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	3.8
	Benzo(k)fluoranthene	mg/kg	0.5						7.9	20	29	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	5.4
	Chrysene	mg/kg	0.5						5	25	33	<0.5	<0.5	<0.5	<0.5	3.2	<0.5	6.9
	Benzo[b+j]fluoranthene	mg/kg	0.5						13	28	31	<0.5	<0.5	<0.5	<0.5	2.8	<0.5	5.7
	Dibenz(a,h)anthracene	mg/kg	0.5						0.7	6.2	6.7	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.4
	Fluoranthene	mg/kg	0.5						32	71	99	<0.5	0.6	<0.5	<0.5	6.2	<0.5	12
	Fluorene	mg/kg	0.5						2	3.1	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						3.4	23	21	<0.5	<0.5	<0.5	<0.5	2	<0.5	4
	Naphthalene	mg/kg	0.5			3			1.5	0.9	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Phenanthrene	mg/kg	0.5						31	49	55	<0.5	<0.5	<0.5	<0.5	2.8	<0.5	4.9
	Pyrene	mg/kg	0.5						28	66	91	<0.5	0.5	<0.5	<0.5	5.7	<0.5	10
	Total PAHs	mg/kg	0.5	300						148.1	384.6	498.6	<0.5	1.1	<0.5	<0.5	36.1	<0.5
TPH	C10 - C14	mg/kg	20						<20	41	<20	<20	<20	<20	<20	<20	<20	21
	C15 - C28	mg/kg	50						160	1000	790	<50	<50	<50	<50	160	<50	200
	C29 - C36	mg/kg	50						<50	290	350	<50	<50	<50	<50	92	<50	110
	C10 - C36 (Sum of total)	mg/kg	50						160	1331	1140	<50	<50	<50	<50	252	<50	331
Volatile	Benzene	mg/kg	0.1		65	0.5	0.5	77	<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		125	57			<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		105	160	220		<0.1	<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2						<0.2	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1						<0.1	<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3		45	40	60		<0.3	<0.3	< 0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3

Result 'NEPM 2013 HILs Residential A Soil

Result Environmental Investigation/Screening Levels - Urban Residential/public open space

Result Health Screening Level Residential A/B Landuse, 0 to <2m, Sand for

Result HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion

Notes:

* Sample Re-analysed by Laboratory

380 Value exceeds HIL-A (UCL 95% Stat used = 143mg/kg

				Field_ID	BH8-0.0-0.2	BH8-0.5-0.6	BH9-0.4-0.6	BH9-0.7-0.8	BH10-0.0-0.2	BH10-0.5-0.6
				LocCode	BH8-0.0-0.2	BH8-0.5-0.6	BH9-0.4-0.6	BH9-0.7-0.8	BH10-0.0-0.2	BH10-0.5-0.6
				Sampled_Date	18-Jan-21	18-Jan-21	18-Jan-21	18-Jan-21	18-Jan-21	18-Jan-21
Method	ChemName	Units	EQL	NEPM 2013 HILs Residential A Soil	EIL/ESL	HSL-A/B, 0 to <1m, Sand Soils for Vapour Intrusion	HSL-A/B, 1 to <2m, Sand Soils for Vapour Intrusion	HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion		
Metals	Arsenic	mg/kg	2	100	100				3.6	7.7
	Cadmium	mg/kg	0.4	20					<0.4	<0.4
	Chromium	mg/kg	5		480				6	12
	Copper	mg/kg	5	6000	120				20	15
	Lead	mg/kg	5	300	1100				50	49
	Mercury	mg/kg	0.1	40					<0.1	<0.1
	Nickel	mg/kg	5	400	50				<5	<5
	Zinc	mg/kg	5	7400	290				140	85
Inorganic	Moisture Content (dried @ 103°C)	%	1						18	6.4
Organic	Naphthalene	mg/kg	0.5		170	3			<0.5	<0.5
	F2-NAPHTHALENE	mg/kg	50				240		<500	71
	C6 - C9	mg/kg	20						<20	<20
	C10 - C40 (Sum of total)	mg/kg	100						<1000	401
	C6-C10 less BTEX (F1)	mg/kg	20			44	70		<20	<20
	C10-C16	mg/kg	50		120	110			<500	71
	C16-C34	mg/kg	100		1300				<1000	330
	C34-C40	mg/kg	100		5600				<1000	<100
PAH	C6 - C10	mg/kg	20		120				<20	<20
	Acenaphthene	mg/kg	0.5						<0.5	<0.5
	Acenaphthylene	mg/kg	0.5						<0.5	<0.5
	Anthracene	mg/kg	0.5						<0.5	<0.5
	Benzo(a)anthracene	mg/kg	0.5						<0.5	<0.5
	Benzo(a)pyrene	mg/kg	0.5		0.7				<0.5	<0.5
	Benzo(a)pyrene TEQ (lower bound) *	MG/KG	0.5						<0.5	<0.5
	Benzo(a)pyrene TEQ (medium bound) *	MG/KG	0.5	3					0.6	0.6
	Benzo(a)pyrene TEQ (upper bound) *	MG/KG	0.5						1.2	1.2
	Benzo(g,h,i)perylene	mg/kg	0.5						<0.5	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5						<0.5	<0.5
	Chrysene	mg/kg	0.5						<0.5	<0.5
	Benzo[b+j]fluoranthene	mg/kg	0.5						<0.5	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5						<0.5	<0.5
	Fluoranthene	mg/kg	0.5						0.8	<0.5
	Fluorene	mg/kg	0.5						<0.5	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5	<0.5
	Naphthalene	mg/kg	0.5			3			<0.5	<0.5
	Phenanthrene	mg/kg	0.5						<0.5	0.5
	Pyrene	mg/kg	0.5						0.7	<0.5
	Total PAHs	mg/kg	0.5	300					1.5	<0.5
TPH	C10 - C14	mg/kg	20						<200	31
	C15 - C28	mg/kg	50						<500	240
	C29 - C36	mg/kg	50						<500	160
	C10 - C36 (Sum of total)	mg/kg	50						<500	431
Volatile	Benzene	mg/kg	0.1		65	0.5	0.5	77	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1		125	57			<0.1	<0.1
	Toluene	mg/kg	0.1		105	160	220		<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2						<0.2	<0.2
	Xylene (o)	mg/kg	0.1						<0.1	<0.1
	Xylene Total	mg/kg	0.3		45	40	60		<0.3	<0.3
Result				NEPM 2013 HILs Residential A Soil						
Result				Environmental Investigation/Screening Levels - Urban Residential/public open space						
Result				Health Screening Level Residential A/B Landuse, 0 to <2m, Sand for						
Result				HSL-intrusive maintenance worker, 0 to <2m, Sand for Vapour Intrusion						
Notes:										
				* Sample Re-analysed by Laboratory						
				380 Value exceeds HIL-A (UCL 95% Stat used = 143mg/kg)						

			21-01-21	21-01-21	21-01-21	21-01-21	21-01-21	21-01-21
			GBH02 2.5m	GBH02 4.0m	GBH02 8.5m	GHB02 10.0m	GHB02 11.5m	GHB02 14.5m
ASS Field Screening Analysis								
pH (F)	pH Unit	0.1	7	7.3	8.7	8.1	7.8	7.6
pH (Fox)	pH Unit	0.1	2.8	3.3	2	1.3	2.1	2.1
Reaction Rate	-	1	3	3	4	4	3	3

Notes:

pH F(ox) Reaction

- 1 Slight
- 2 Moderate
- 3 Strong
- 4 Extreme

			21-01-21	21-01-21	21-01-21	21-01-21	21-01-21	21-01-21	21-01-21
			GBH02 16.0m	GBH02 17.5m	GBH02 19.0m	GBH03 3.0m	GBH03 4.5m	GBH03 7.5m	GBH03 10.5m
ASS Field Screening Analysis									
pH (F)	pH Unit	0.1	8.7	8.6	8.5	6.3	7	8.8	8.1
pH (Fox)	pH Unit	0.1	1.6	1.5	2	3.6	1.9	2.7	1.3
Reaction Rate	-	1	4	4	4	3	4	3	4

Notes:

pH F(ox) Reaction

- 1 Slight
- 2 Moderate
- 3 Strong
- 4 Extreme

			21-01-21	21-01-21	21-01-21	21-01-21	21-01-21
			GBH03 12.0m	GBH03 15.0m	GBH03 16.5m	GBH03 18.0m	GBH03 19.5m
ASS Field Screening Analysis							
pH (F)	pH Unit	0.1	8	7.7	7	7.1	7.9
pH (Fox)	pH Unit	0.1	5.1	1.8	2.4	2	6.8
Reaction Rate	-	1	4	4	4	3	4

Notes:

pH F(ox) Reaction

- 1 Slight
- 2 Moderate
- 3 Strong
- 4 Extreme



Field Duplicates (SOIL)
Filter: SDG in (20-Jan-2021)

Table LR3
QA/QC RPDs Soil
Newcastle Grammar School - PSI
754-NTLGE282007-AE

APP Corporation PTY LTD

Method	ChemName	Units	EQL	20-Jan-21			20-Jan-21			20-Jan-21			20-Jan-21		
				Field ID	Sampled Date	RPD	Field ID	Sampled Date	RPD	Field ID	Sampled Date	RPD	Field ID	Sampled Date	RPD
Organic	C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10	BH1-0.0-0.2	15-01-21	0	BH1-0.0-0.2	15-01-21	0	BH8-0.0-0.2	18-01-21	0	BH8-0.0-0.2	18-01-21	0
Volatile	Benzene	mg/kg	0.1 (Primary): 0	QC1	15-01-21	0	QC2	15-01-21	0	QC3	18-01-21	0	QC4	18-01-21	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0			0			0			0			0
	Toluene	mg/kg	0.1 (Primary): 0			0			0			0			0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0			0			0			0			0
	Xylene (o)	mg/kg	0.1 (Primary): 0			0			0			0			0
	Xylene Total	mg/kg	0.3 (Primary): 0			0			0			0			0
Inorganic	Moisture Content (dried @ 103°C)	%	1			6.7			6.7			18.0			18.0
Heavy Met	Arsenic	mg/kg	2 (Primary): 5			2.2			2.2			3.6			3.6
	Cadmium	mg/kg	0.4 (Primary): 1			0.4			0.4			0.4			0.4
	Chromium	mg/kg	5 (Primary): 2			13.0			8.2			5.0			4.0
	Copper	mg/kg	5			7.2			7.2			16.0			15.0
	Lead	mg/kg	5			8.4			8.4			40.0			37.0
	Mercury	mg/kg	0.1			0.3			0.3			0.1			0.1
	Nickel	mg/kg	5 (Primary): 2			9.7			9.7			5.0			2.0
	Zinc	mg/kg	5			22.0			22.0			110.0			106.0
Organic	Naphthalene	mg/kg	0.5 (Primary): 1			0.5			0.5			0.5			0.5
PAH	Acenaphthene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Acenaphthylene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Anthracene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Benzo(a)anthracene	mg/kg	0.5			0.5			0.5			0.5			0.6
	Benzo(a)pyrene	mg/kg	0.5			0.5			0.5			0.5			0.6
	Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5			0.5			0.5			0.5			0.7
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5			0.6			0.6			0.6			1.0
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5			1.2			1.2			1.2			1.4
	Benzo(g,h,i)perylene	mg/kg	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
	Chrysene	mg/kg	0.5			0.5			0.5			0.5			0.7
	Benzo[b+j]fluoranthene	mg/kg	0.5			0.5			0.5			0.5			0.8
	Dibenz(a,h)anthracene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Fluoranthene	mg/kg	0.5			0.5			0.5			0.8			0.8
	Fluorene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Naphthalene	mg/kg	0.5 (Primary): 1			0.5			0.5			0.5			0.5
	Phenanthrene	mg/kg	0.5			0.5			0.5			0.5			0.5
	Pyrene	mg/kg	0.5			0.5			0.5			0.7			0.7
	Total PAHs	mg/kg	0.5			0.5			0.5			1.5			1.5
Organic	F2-NAPHTHALENE	mg/kg	50			50.0			50.0			500.0			500.0
	C6 - C9	mg/kg	20 (Primary): 10			20.0			20.0			20.0			20.0
	C10 - C40 (Sum of total)	mg/kg	100 (Primary): 5			100.0			100.0			400.0			400.0
	C10-C16	mg/kg	50			50.0			50.0			50.0			50.0
	C16-C34	mg/kg	100			100.0			100.0			260.0			260.0
	C34-C40	mg/kg	100			100.0			100.0			140.0			140.0
	C6 - C10	mg/kg	20 (Primary): 10			20.0			20.0			20.0			20.0
TPH	C10 - C14	mg/kg	20 (Primary): 50			20.0			20.0			20.0			20.0
	C15 - C28	mg/kg	50 (Primary): 10			50.0			50.0			160.0			160.0
	C29 - C36	mg/kg	50 (Primary): 10			50.0			50.0			150.0			150.0
	C10 - C36 (Sum of total)	mg/kg	50			50.0			50.0			310.0			310.0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Field Blanks (SOIL)
Filter: SDG in('20 Jan 2021');

SDG	20-Jan-21	20-Jan-21
Field ID	TB	TS
Sampled_Date/Time	18-01-21	18-01-21
Sample Type	Trip_B	Trip_Spike

Me	ChemName	Units	EQL		
Organic	Naphthalene	mg/kg	0.5	<0.5	<0.5
	C6 - C9	mg/kg	20	<20	<20
	C6-C10 less BTEX (F1)	mg/kg	20	<20	<20
	C6 - C10	mg/kg	20	<20	<20
Volatile	Benzene	mg/kg	0.1	<0.1	<0.1
	Ethylbenzene	mg/kg	0.1	<0.1	<0.1
	Toluene	mg/kg	0.1	<0.1	<0.1
	Xylene (m & p)	mg/kg	0.2	<0.2	<0.2
	Xylene (o)	mg/kg	0.1	<0.1	<0.1
	Xylene Total	mg/kg	0.3	<0.3	<0.3

	Units	EQL	Action Criteria if More than 1,000 tonnes disturbed Sulfur Trail %S (Fine Texture)	Action Criteria if More than 1,000 tonnes disturbed Acid Trail mol H+ (Fine Texture)	Field ID	21-01-21	21-01-21	21-01-21	21-01-21	21-01-21	21-01-21
					Sampled Date	GBH02 2.5m	GBH02 4.0m	GBH02 10.0m	GBH03 3.0m	GBH03 4.5m	GBH03 12.0m
pH-F (Field pH test)	pH Units	0.1				7.1	5.7	5.3	5.4	5	5.6
pH-FOX (Field pH Peroxide test)	pH Units	0.1				-	-	-	-	-	-
Reaction Ratings*	Comment					-	-	-	-	-	-
pH KCl (23A)	pH Unit	0.1				7.1	5.7	5.3	5.4	5	5.6
Titrateable Actual Acidity	mole H+ / t	2		62		<2	6	9	9	50	7
sulfidic - Titrateable Actual Acidity	% pyrite S	0.02				<0.02	<0.02	<0.02	<0.02	0.08	<0.02
Chromium Reducible Sulfur	% S	0.005	0.1			0.017	0.201	0.063	0.016	0.054	0.008
acidity - Chromium Reducible Sulfur	mole H+ / t	10				10	125	39	<10	34	<10
acidity - Acid Neutralising Capacity	% CaCO3	10				55	-	-	-	-	-
sulfidic - Acid Neutralising Capacity	% pyrite S	0.01				0.09	-	-	-	-	-
ANC Fineness Factor		0.5				1.5	1.5	1.5	1.5	1.5	1.5
Net Acidity (sulfur units)	% S	0.02				<0.02	0.21	0.08	0.03	0.13	<0.02
Net Acidity (acidity units)	mole H+ / t	10				<10	132	48	19	84	12
Liming Rate	kg CaCO3/t	1				<1	10	4	1	6	<1
Net Acidity excluding ANC (sulfur units)	% S	0.02				<0.02	0.21	0.08	0.03	0.13	<0.02
Net Acidity excluding ANC (acidity units)	mole H+ / t	10				10	132	48	19	84	12
Liming Rate excluding ANC	kg CaCO3/t	1				<1	10	4	1	6	<1
Exceeds Action Criteria											

N/R - ANC not required as pH KCE less than 6.5

* Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth; 4.0; Extreme reaction.

Appendix C - Borehole Logs

Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH01**

sheet: 1 of 2

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,363; N: 6,355,233 (MGA94) surface elevation: 2.8 m (AHD) angle from horizontal: 90°
drill model: Geoprobe, Track mounted drilling fluid: None hole diameter : 50 mm

drilling information				material substance						
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description	moisture condition	consistency / relative density
	1 2 3		E				SP	FILL: Gravelly SAND: fine to medium grained, brown to pale brown, fine to medium grained, sub-angular gravels, with grass rootlets.		
					0.5		SP	FILL: SAND: fine to medium grained, white to grey.		
			E				CL-CI	FILL: Sandy CLAY: low to medium plasticity, orange and mottled red, fine to medium grained sand with fine to medium grained gravels.		
				2			SP	FILL: SAND: fine to medium grained, grey to black, with fine to medium grained gravels.		
					1.0					
					1.5			1.5m: gravels become finer grained		
					2.0					
					2.5			2.5m: becomes no gravels		
					3.0					
			E							
					3.5					
							Pt	PEAT: dark grey to black, with petrified roots.		

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration water	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH01**

sheet: 2 of 2

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,363; N: 6,355,233 (MGA94) surface elevation: 2.8 m (AHD) angle from horizontal: 90°
drill model: Geoprobe, Track mounted drilling fluid: None hole diameter : 50 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT ↓	1	2	3						Pt	PEAT: dark grey to black, with petrified roots. (continued)			100 200 300 400	SWAMP DEPOSITS
							4.5			Borehole BH01 terminated at 4.2 m Target depth				
							5.0							
							5.5							
							6.0							
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							81.5							
							82.0							
							82.5							

Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH02**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,357; N: 6,355,220 (MGA94)

surface elevation: 3.1 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe, Track mounted

drilling fluid: None

hole diameter : 50 mm

drilling information						material substance								
method & support	penetration		water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
	1	2												3
PT				E	-3			SP	FILL: Gravelly SAND : fine to medium grained, brown, fine to medium grained, sub-angular gravels, with grass rootlets.				FILL PID: 13.3 ppm	
						0.5		SC	FILL: CLAYEY SAND : fine to medium grained.					
								SP	FILL: SAND .					
								CL	FILL: Sandy CLAY .					
				E		1.0							FILL (COAL REJECT) PID: 1.6 ppm	
					-2			SP	FILL: SAND : brown to black to grey.				FILL	
						1.5			CI	FILL: Sandy CLAY : medium plasticity, brown to black to grey, fine to medium grained sand.				
					-1									
						2.5								
				E		3.0			CI	CLAY : medium plasticity, grey.				PID: 0.1 ppm ALLUVIAL SOIL
					-0									
						3.5			Borehole BH02 terminated at 3.2 m Target depth					

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID: **BH03**

sheet: 1 of 1

project no: **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,350; N: 6,355,223 (MGA94) surface elevation: 2.9 m (AHD) angle from horizontal: 90°
drill model: Geoprobe, Track mounted drilling fluid: None hole diameter : 50 mm

drilling information						material substance									
method & support	penetration		water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations		
PT	1	2	Encountered	E	-	0.5		GP	FILL: GRAVEL: fine grained.	-	-	100 200 300 400	FILL		
	3			SP				FILL: Gravelly SAND: fine to medium grained, brown, fine to medium grained, sub-angular gravels.	FILL (TOPSOIL) PID: 9.1 ppm						
				SP				FILL: SAND.	FILL (COAL REJECT) PID: 8.1 ppm						
		E						CL	FILL: Sandy CLAY: low plasticity, mottled red and grey.				FILL		
		E						CH	FILL: CLAY: high plasticity, yellow and mottled grey.				PID: 0.2 ppm		
					-1	2.0		SC	FILL: CLAYEY SAND: fine to medium grained, pale brown.						
						2.5									
						3.0		SP	FILL: SAND: fine to medium grained, pale brown, with fine to coarse grained sub-angular gravels.						
								Pt	PEAT: dark grey to black.				SWAMP DEPOSITS		
						3.5			Borehole BH03 terminated at 3.2 m Target depth						
					-1										

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID: **BH04**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,298; N: 6,355,246 (MGA94)

surface elevation: 2.4 m (AHD)

angle from horizontal: 90°

drill model: Geoprobe, Track mounted

drilling fluid: None

hole diameter : 50 mm

drilling information						material substance									
method & support	1 penetration	2 penetration	3	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations	
PT				Encountered	E				GP	Sandy GRAVEL: fine to medium grained, sub-angular, brown, fine to medium grained sand, with grass rootlets.				FILL (TOPSOIL)	
															FILL (GENERAL)
															FILL (COAL REJECT)
															FILL (GENERAL)
						</									

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID: **BH05**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

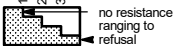
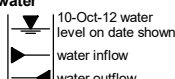
date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,301; N: 6,355,259 (MGA94) surface elevation: 2.2 m (AHD) angle from horizontal: 90°
drill model: Geoprobe, Track mounted drilling fluid: None hole diameter : 50 mm

drilling information					material substance									
method & support	1 penetration	2 penetration	3 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT				Encountered	E				SP	FILL: Gravelly SAND: fine grained, brown, with fine grained sub-angular gravels, with grass rootlets.			</	

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud C casing penetration  water 	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit WI liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Borehole

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH06**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,314; N: 6,355,268 (MGA94) surface elevation: 2.1 m (AHD) angle from horizontal: 90°
drill model: Geoprobe, Track mounted drilling fluid: None hole diameter : 50 mm

drilling information					material substance									
method & support	1 penetration	2 penetration	3 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	structure and additional observations
PT				Encountered	E	-2		SP	FILL: Gravelly SAND: fine to coarse grained, brown, fine grained sub-angular gravels.					FILL (TOPSOIL) PID: 6.4 ppm
					E	0.5		CI	FILL: CLAY: medium plasticity, brown to grey.					FILL (GENERAL) PID: 4.4 ppm
								SP	FILL: SAND: fine to medium grained, brown.					FILL: Sandy CLAY: low to medium plasticity, mottled red and brown to grey, fine grained sub-angular gravels, some red brick fragments.
								CL-CI						
								SP	FILL: SAND: fine to medium grained, brown to grey.					
								CH	FILL: CLAY: high plasticity, grey to black, trace ceramic fragments 1.8 - 1.9m.					
					0			Borehole BH06 terminated at 2.1 m Target depth						
							2.5							
							3.0							
							3.5							

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Hand Auger

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH07**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,325; N: 6,355,272 (MGA94) surface elevation: 2.1 m (AHD) angle from horizontal: 90°
drill model: Hand Auger drilling fluid: None hole diameter : 50 mm

drilling information						material substance							
method & support	penetration		water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description SOIL NAME: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
PT	1	2		E	-2			SP	FILL: SAND: fine to medium grained, brown and yellow, fine grained sub-angular gravels, with grass rootlets.				FILL (GENERAL) PID: 6.2 ppm
	3												
		B											
		E		0.5									
									Hand Auger BH07 terminated at 0.6 m Target depth				PID: 2.1 ppm
						1.0							
						1.5							
						2.0							
						2.5							
						3.0							
						3.5							

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Hand Auger

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH08**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

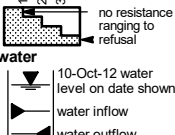
date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,362; N: 6,355,253 (MGA94) surface elevation: 2.4 m (AHD) angle from horizontal: 90°
drill model: Hand Auger drilling fluid: None hole diameter : 70 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
HA	1	2	3		E				SP	FILL: SAND: fine to medium grained, brown, fine ot medium grained sub-angular gravels.	D - M		100	FILL (TOPSOIL)
													PID: 8.2 ppm	
					-2					0.3m: becomes dark brown				FILL (GENERAL)
				E		0.5				Hand Auger BH08 terminated at 0.6 m Target depth				PID: 2 ppm
							1.0							
							1.5							
						</								

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud C casing penetration  water	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Hand Auger

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID: **BH09**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

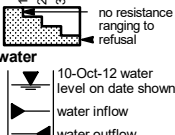
date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,333; N: 6,355,158 (MGA94) surface elevation: 3.0 m (AHD) angle from horizontal: 90°
drill model: Hand Auger drilling fluid: None hole diameter : 70 mm

drilling information						material substance								
method & support	penetration			water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	structure and additional observations
HA	1	2	3		E	0			SP	FILL: SAND: fine to medium grained, pale brown, fine grained, sub-angular to sun-rounded gravels.	D - M		100	FILL (TOPSOIL)
									0.2m: becomes dark brown	200			PID: 10.1 ppm	
				E		0.5	SC		FILL: CLAYEY SAND: fine to medium grained, brown.	300			FILL (GENERAL)	
									0.7m: becomes brown and mottled black	400			PID: 4.1 ppm	
				E										PID: 0.6 ppm
						-2	1.0			Hand Auger BH09 terminated at 0.8 m Target depth				
							1.5							

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. B blank bit T TC bit V V bit	support M mud N nil C casing penetration  no resistance ranging to refusal 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Engineering Log - Hand Auger

client: **Newcastle Grammar School**

principal:

project: **Newcastle Grammar School - Park Campus**

location: **127 Union Street, Cooks Hill, 2300**

Borehole ID. **BH10**

sheet: 1 of 1

project no. **754-NTLGE282007**

date started: **15 Jan 2021**

date completed: **15 Jan 2021**

logged by: **SB**

checked by: **SJB**

position: E: 384,356; N: 6,355,190 (MGA94) surface elevation: 3.2 m (AHD) angle from horizontal: 90°
drill model: Hand Auger drilling fluid: None hole diameter : 70 mm

drilling information					material substance				
method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	soil group symbol	material description	structure and additional observations
HA	1 2 3		E				SP	FILL: SAND: fine grained, dark brown, with fine grained sub-angular gravels and grass rootlets. 0.3m: becomes pale brown	FILL (TOPSOIL) PID: 6.4 ppm
			E		0.5		SC	FILL: CLAYEY SAND: fine to medium grained, pale brown. 0.5m: red brick fragments Hand Auger BH10 terminated at 0.6 m Target depth	FILL (GENERAL) PID: 3.8 ppm
				-2	1.0				
					1.5				

method AD auger drilling* AS auger screwing* HA hand auger W washbore HA hand auger PT push tube * bit shown by suffix e.g. AD/T B blank bit T TC bit V V bit	support M mud N nil C casing penetration  no resistance ranging to refusal water 10-Oct-12 water level on date shown water inflow water outflow	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remoulded (kPa) R refusal HB hammer bouncing	soil group symbol & soil description based on AS 1726:2017 moisture condition D dry M moist W wet Wp plastic limit Wl liquid limit	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Appendix D - Calibration Certificate

EQUIPMENT CERTIFICATION REPORT

PGN9003827 GAS DETECTOR - PID

Plant Number: 234968

SENSOR	CONCENTRATION	SPAN	TRACEABILITY	PASS
PID Isobutylene	100ppm	<u>100</u> ppm	Lot # <u>1074828</u>	☒

Data Cleared ☒

Battery Status <u>100</u> (min 7.2V)	Temperature <u>18.6</u> °C
Electrical Test & Tag (AS/NZS 3760)	Inlet Filter Checked/Changed

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' \$55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: Jacob Arnold Date: 11 / 01 / 21 Signed: *J Arnold*

Accessories List:

User's Manual	Charger / Comms Adaptor	Wall Charger
2x Spare Air Filters	1x Spare Rechargeable Battery	Carry Transit Case
	Calibration Report	



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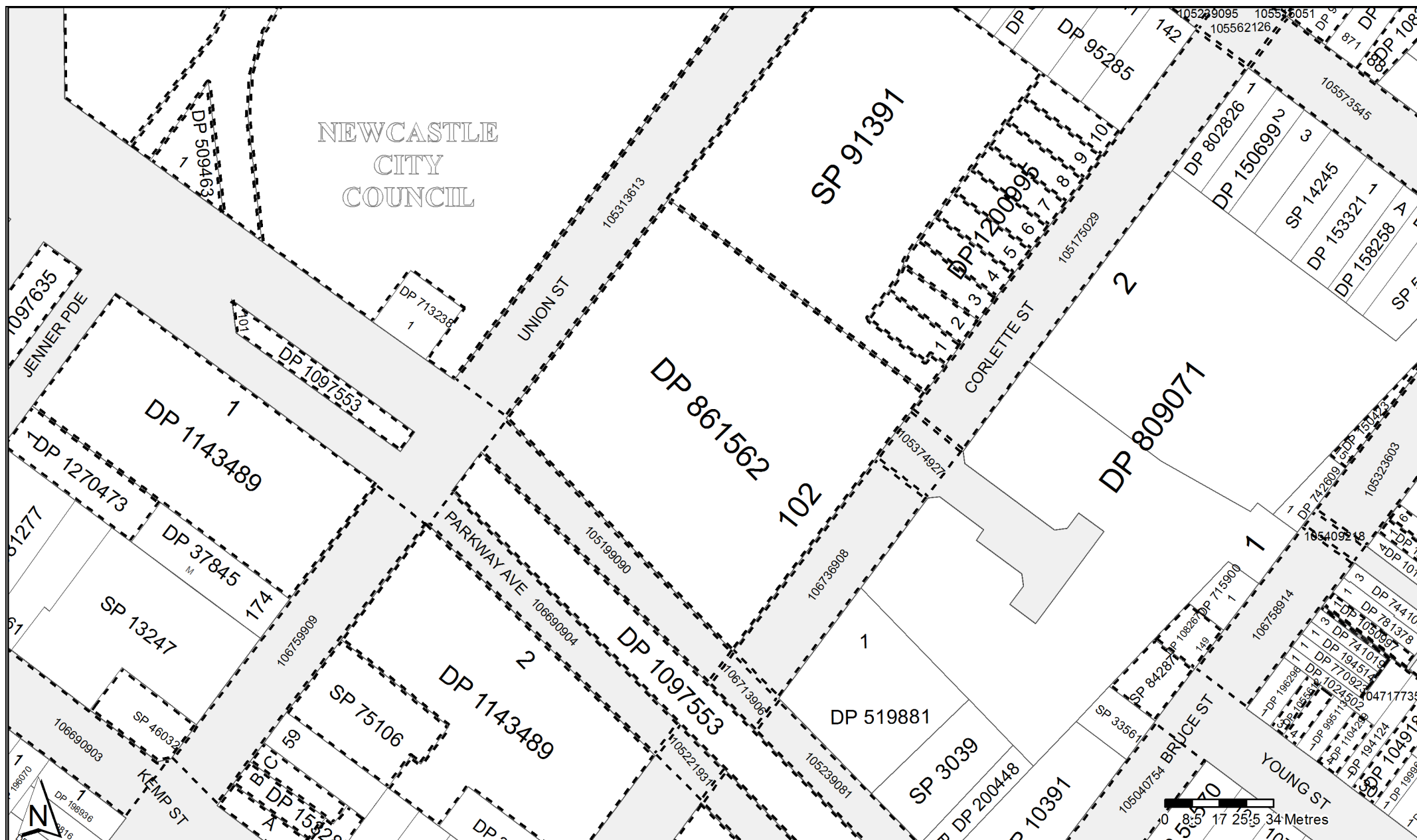
Appendix E - Historical Titles

Locality : COOKS HILL

Parish : NEWCASTLE

LGA : NEWCASTLE

County : NORTHUMBERLAND



	Status	Surv/Comp	Purpose
DP150423 Lot(s): 151  CA113188 - LOT 151 DP150423			
DP153284 Lot(s): A, B, C, D  DP649782	REGISTERED	SURVEY	EASEMENT
DP509463 Lot(s): 1  CA92079 - LOT 1 DP509463			
DP861562 Lot(s): 102  DP1165476	REGISTERED	SURVEY	EASEMENT
 CA153523 - NPW			
DP997879 Lot(s): 1  DP994018	HISTORICAL	SURVEY	SURVEY INFORMATION ONLY
DP1049184 Lot(s): 30  CA87706 - LOT 30 DP1049184			
DP1050997 Lot(s): 1  CA87953 - LOT 1 DP1050997			
DP1055612 Lot(s): 3, 4  CA88379 - LOTS 3-4 DP1055612			
DP1065483 Lot(s): 232  CA89675 - LOT 232 DP1065483			
DP1082670 Lot(s): 149  CA93088 - LOT 149 DP1082670			
DP1082685 Lot(s): 88  CA92996 - LOT 88 DP1082685			
DP1097553 Lot(s): 100, 101  CA99397 - LOTS 100-101 DP1097553			
DP1097624 Lot(s): 100  CA99441 - LOT 100 DP1097624			
DP1097635 Lot(s): 104  CA99175 - LOTS 100-104 DP1097635			
DP1104299 Lot(s): 4  CA102108 - LOT 4 DP1104299			
DP1119864 Lot(s): 6  CA119185 - LOT 6 DP1119864			
DP1143489 Lot(s): 1  DP37845	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 2, 3  DP37835	HISTORICAL	SURVEY	UNRESEARCHED
Lot(s): 2  DP31645	HISTORICAL	COMPILATION	UNRESEARCHED
 DP657003	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1174209 Lot(s): 1  CA139022 - LOT 1 DP1174209			

Caution: This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

	Status	Surv/Comp	Purpose
DP1200995			
Lot(s): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10			
 DP861562	HISTORICAL	COMPILATION	SUBDIVISION
 DP1050041	HISTORICAL	SURVEY	SUBDIVISION
 DP1197709	HISTORICAL	SURVEY	SUBDIVISION
 CA153523 - NPW			
DP1247433			
Lot(s): 1			
 DP742162	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1270473			
Lot(s): 1			
 DP37845	HISTORICAL	SURVEY	UNRESEARCHED
SP46032			
 SP84054	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP75106			
 DP37835	HISTORICAL	SURVEY	UNRESEARCHED
 DP813793	HISTORICAL	SURVEY	REDEFINITION
 DP1080266	HISTORICAL	SURVEY	CONSOLIDATION
 SP85085	REGISTERED	COMPILATION	STRATA SUBDIVISION PLAN
SP84287			
 DP150773	HISTORICAL	SURVEY	UNRESEARCHED
 DP1156435	HISTORICAL	SURVEY	DELIMITATION
SP91391			
 DP861562	HISTORICAL	COMPILATION	SUBDIVISION
 DP1050041	HISTORICAL	SURVEY	SUBDIVISION
 DP1197709	HISTORICAL	SURVEY	SUBDIVISION
 CA153523 - NPW			
Road			
Polygon Id(s): 105313613			
 NSW GAZ.	09-02-2018	Folio : 589	
DEDICATED PUBLIC ROAD			
AFFECTING THE LAND SHOWN IN THE DIAGRAM ACCOMPANYING THIS GAZETTE NOTIFICATION			
Polygon Id(s): 105515051			
 NSW GAZ.	02-02-2018	Folio : 523	
DEDICATED PUBLIC ROAD			
AFFECTING THE LAND SHOWN IN THE DIAGRAM ACCOMPANYING THIS GAZETTE NOTIFICATION			
Polygon Id(s): 106690903, 106759909			
 NSW GAZ.	09-02-2018	Folio : 591	
DEDICATED PUBLIC ROAD			
AFFECTING THE LAND SHOWN IN THE DIAGRAM ACCOMPANYING THIS GAZETTE NOTIFICATION			
Polygon Id(s): 105035153, 105040754, 105175029, 105199090, 105221931, 105239081, 105239095, 105323603, 105374927, 105409218, 105562126, 105573545, 106690904, 106713906, 106736908, 106758914			
 NSW GAZ.	25-01-2018	Folio : 236	
DEDICATED PUBLIC ROAD			
AFFECTING THE LAND SHOWN IN THE DIAGRAM ACCOMPANYING THIS GAZETTE NOTIFICATION			
Unidentified			
Polygon Id(s): 104717735			
	UNCONVERTIBLE OLD SYSTEM RESIDUE SUBJECT TO A RIGHT OF WAY. FEE REMAINS IN CONVEYANCE BOOK 395 NO. 223. TITLE CREATION WILL REQUIRE A DEPOSITED PLAN OF SURVEY AND A PRIMARY APPLICATION BASED UPON ADVERSE POSSESSION		

Caution: This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL** **ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

Plan	Surv/Comp	Purpose
DP31645	COMPILATION	UNRESEARCHED
DP32605	SURVEY	UNRESEARCHED
DP37263	SURVEY	UNRESEARCHED
DP37549	SURVEY	UNRESEARCHED
DP37717	SURVEY	UNRESEARCHED
DP37845	SURVEY	UNRESEARCHED
DP95285	SURVEY	UNRESEARCHED
DP150423	COMPILATION	UNRESEARCHED
DP150699	COMPILATION	UNRESEARCHED
DP153284	SURVEY	UNRESEARCHED
DP153321	COMPILATION	UNRESEARCHED
DP153960	COMPILATION	UNRESEARCHED
DP158258	SURVEY	UNRESEARCHED
DP194124	COMPILATION	DEPARTMENTAL
DP194514	COMPILATION	DEPARTMENTAL
DP195745	COMPILATION	DEPARTMENTAL
DP196070	COMPILATION	DEPARTMENTAL
DP196296	COMPILATION	DEPARTMENTAL
DP198936	COMPILATION	DEPARTMENTAL
DP199962	COMPILATION	DEPARTMENTAL
DP200448	SURVEY	SUBDIVISION
DP509463	COMPILATION	RESUMPTION OR ACQUISITION
DP519881	SURVEY	SUBDIVISION
DP529278	COMPILATION	SUBDIVISION
DP581277	SURVEY	SUBDIVISION
DP626095	SURVEY	SUBDIVISION
DP707230	COMPILATION	DEPARTMENTAL
DP713238	COMPILATION	OLD SYSTEM CONVERSION
DP715900	COMPILATION	DEPARTMENTAL
DP741019	COMPILATION	DEPARTMENTAL
DP741542	COMPILATION	DEPARTMENTAL
DP742609	COMPILATION	DEPARTMENTAL
DP744108	COMPILATION	DEPARTMENTAL
DP770923	COMPILATION	DEPARTMENTAL
DP779265	COMPILATION	DEPARTMENTAL
DP781378	COMPILATION	DEPARTMENTAL
DP799802	COMPILATION	DEPARTMENTAL
DP799816	COMPILATION	DEPARTMENTAL
DP802826	SURVEY	REDEFINITION
DP809071	SURVEY	SUBDIVISION
DP861562	COMPILATION	SUBDIVISION
DP978287	COMPILATION	UNRESEARCHED
DP995113	COMPILATION	DEPARTMENTAL
DP997879	COMPILATION	DEPARTMENTAL
DP1010772	COMPILATION	LIMITED FOLIO CREATION
DP1012004	COMPILATION	LIMITED FOLIO CREATION
DP1024502	COMPILATION	LIMITED FOLIO CREATION
DP1049184	COMPILATION	LIMITED FOLIO CREATION
DP1050997	COMPILATION	LIMITED FOLIO CREATION
DP1055612	COMPILATION	LIMITED FOLIO CREATION
DP1065483	COMPILATION	LIMITED FOLIO CREATION
DP1082670	COMPILATION	LIMITED FOLIO CREATION
DP1082685	COMPILATION	LIMITED FOLIO CREATION
DP1097553	COMPILATION	LIMITED FOLIO CREATION
DP1097624	COMPILATION	LIMITED FOLIO CREATION
DP1097635	COMPILATION	LIMITED FOLIO CREATION
DP1104299	COMPILATION	LIMITED FOLIO CREATION
DP1119864	COMPILATION	LIMITED FOLIO CREATION
DP1143489	SURVEY	CONSOLIDATION
DP1174209	COMPILATION	LIMITED FOLIO CREATION
DP1200995	SURVEY	SUBDIVISION
DP1200995	UNRESEARCHED	SUBDIVISION
DP1247433	SURVEY	REDEFINITION
DP1270473	SURVEY	REDEFINITION
SP3039	COMPILATION	STRATA PLAN

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Plan	Surv/Comp	Purpose
SP10391	COMPILATION	STRATA PLAN
SP13247	COMPILATION	STRATA PLAN
SP14245	COMPILATION	STRATA PLAN
SP33561	COMPILATION	STRATA PLAN
SP46032	COMPILATION	STRATA PLAN
SP50944	COMPILATION	STRATA PLAN
SP58570	COMPILATION	STRATA PLAN
SP75106	COMPILATION	STRATA PLAN
SP84287	COMPILATION	STRATA PLAN
SP84287	UNRESEARCHED	STRATA PLAN
SP91391	COMPILATION	STRATA PLAN

Caution: This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL** **ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

3721228 U

Licence: AUS/0634/96

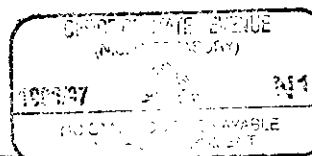
TRANSFER

New South Wales
Real Property Act 1900



Instructions for filling out
this form are available
from the Land Titles Office

Office of State Revenue use only



6.1
246

- (A) **LAND TRANSFERRED**
If appropriate, specify the
share or part transferred.

FOLIO IDENTIFIER 102/861562

- (B) **LODGED BY**

LTO Box

Name, Address or DX and Telephone

245

CTB

Reference (15 character maximum):

037954-TE93

- (C) **TRANSFEROR** MINISTER FOR EDUCATION & TRAINING

- (D) acknowledges receipt of the consideration of ... \$2,102,500.00
and as regards the land specified above transfers to the transferee an estate in fee simple.

- (E) Encumbrances (if applicable): 1. 2. 3.

- (F) **TRANSFeree**

T
TS
(s713 LGA)
TW
(Sheriff)

ACN 054 234 141
NEWCASTLE GRAMMAR SCHOOL LTD. OF 60 NEWCOMEN STREET, NEWCASTLE
2300

TENANCY:

- (H) We certify this dealing correct for the purposes of the Real Property Act 1900. DATE 22/12/97
Signed in my presence by the transferor who is personally known to me.

Signature of Witness

RODNEY JOHN GRAHAM
Name of Witness (BLOCK LETTERS)
1 OXFORD STREET DARLINGHURST
Address of Witness

Signed by as delegate of
the Minister for Education and Training under Instrument of
Delegation given in accordance with Section 29 of the
Technical and Further Education Commission Act, 1990.

Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Signature of Transferee

If signed on the transferee's behalf by a solicitor or licensed
conveyancer, show the signatory's full name in block letters.
GILDA ELLENE HOJER, SOLICITOR FOR TRANSFeree

FP37835

City of Greater Newcastle. Sh.4

PLAN

of Lots 159 to 174 Sec L & Lots 156 to 173. Sec M. Newcastle.

Part of Portion 268^A 2000 acres.

Australian Agricultural Company's Estate.

PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND

Scale 100 feet to an inch.

REFERENCE TO TITLE.

Crown Grant dated 20th Nov^r. 1847.

Reg Book No. 80. fol. 503/512.

Easements and restrictive covenants, if any, will be embodied in the conveyances of lots shown hereon.

Australian Agricultural Company (Vendor)

W. J. Reel
Secretary.

This is the plan numbered & recorded as
REGISTERED PLAN No. 835
on the 20th day of July 1939

W. J. Reel
REGISTRAR GENERAL



THE COUNCIL OF THE CITY OF GREATER
NEWCASTLE.

Approved by Council and covered by Town
Clerk's Certificate N^o 311

of 6th July 1939.

W. J. Reel
Town Clerk.

Subscribed and declared before me at
Newcastle this 14th day of June, 1939.

I, Reginald Frederick Bruyn, of Newcastle, a surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare, (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented on this plan has been made in accordance with the Survey Practice Regulations, 1933, by me, was completed on 7th June 1939, and the reference marks have been placed as shown hereon. And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act, 1900.

R. F. Bruyn

Surveyor, registered under the Surveyors Act, 1929.

Datum line of Azimuth A-B.



CONVERSION TABLE ADDED IN
REGISTRAR GENERAL'S DEPARTMENT

DP 37835

FEET INCHES		METRES
-	1 3/4	0.044
1	6	0.457
2	1 1/2	0.648
2	3 1/2	0.699
10	0 3/4	3.067
13	-	3.962
30	-	9.144
30	0 1/4	9.150
34	-	10.363
40	-	12.192
40	0 1/4	12.198
41	-	12.497
41	0 1/4	12.503
41	6	12.649
44	-	13.411
46	-	14.021
46	6	14.173
46	7 1/4	14.205
46	11	14.300
47	-	14.326
47	0 3/4	14.345
47	5	14.453
47	5 1/4	14.459
47	5 1/2	14.465
47	7 1/2	14.516
48	-	14.630
48	9	14.859
49	5 3/4	15.081
49	7	15.113
49	9 1/4	15.170
50	-	15.240
50	0 1/2	15.253
50	2 3/4	15.310
50	7 1/2	15.431
52	-	15.850
52	8 1/4	16.059
53	-	16.154
56	7 1/4	17.253
57	2 1/2	17.437
57	5 3/4	17.520
63	2 1/4	19.260
66	-	20.117
66	9 3/4	20.364
69	7 1/2	21.222
105	5	32.131
107	11 3/4	32.912
110	6 1/2	33.693
112	9	34.366
116	1 3/4	35.401
117	0 3/4	35.681
120	-	36.576
121	9 1/2	37.122
122	-	37.186
123	5 1/2	37.630
123	6	37.643
126	5	38.532
127	5 1/2	38.849
129	4	39.421
130	3	39.700
130	6	39.776
132	3	40.310
133	1 1/2	40.577
133	4 1/2	40.653
135	7 1/2	41.339
136	6	41.605
138	9 1/4	42.297
139	10	42.621
140	1	42.697
140	6	42.824
141	9	43.205
142	2 1/2	43.345
142	3 3/4	43.377
142	8	43.485
142	9	43.510
142	11 1/2	43.574
143	3	43.663
144	5 1/4	44.025



CONVERSION TABLE ADDED IN
REGISTRAR GENERAL'S DEPARTMENT

DP 37835 CONTINUED

FEET INCHES		METRES
145	0 5/8	44.212
145	1	44.221
149	7	45.593
149	8	45.618
150	1	45.745
154	3	47.015
170	10 3/4	52.089
176	10 1/2	53.912
188	7 3/4	57.499
188	10 1/2	57.569
188	11 3/4	57.601
189	1 1/4	57.639
189	2 3/4	57.677
201	3 3/4	61.360
331	3 3/4	100.984

AC	RD	P	SQ	M
-	-	18.4	465.4	
-	-	19 1/2	493.2	
-	-	20.7	523.6	
-	-	21.1	533.7	
-	-	21.7	548.9	
-	-	22	556.4	
-	-	22.2	561.5	
-	-	22.4	566.6	
-	-	22.6	571.6	
-	-	22.7	574.1	
-	-	22.8	576.7	
-	-	23.2	586.8	
-	-	23.6	596.9	
-	-	24.3	614.6	
-	-	24.6	622.2	
-	-	25	632.3	
-	-	25.1	634.8	
-	-	25.6	647.5	
-	-	25.9	655.1	
-	-	26.2	662.7	
-	-	26.7	675.3	
-	-	29 1/2	746.1	
-	-	30.3	766.4	
-	-	30.4	768.9	
-	-	31.4	794.2	
-	-	31.7	801.8	
-	-	32 1/2	822	
-	-	37	935.8	

PLAN FORM 2

Plan Drawing only to appear in this space

OFFICE USE ONLY

Signatures and seals only.

1 hereby certify that - (a) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (b) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (c) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (d) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (e) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (f) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (g) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (h) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (i) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (j) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (k) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (l) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (m) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (n) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (o) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (p) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (q) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (r) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (s) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (t) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (u) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (v) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (w) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (x) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (y) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein (z) the requirements of the Local Government Act, 1919 (NSW) have been complied with in relation to the proposed "new road", "subdivision" or "consolidated lot" set out herein		Consolidated Lot No. 1 Subdivision No. 1 Date: 26th March, 1987 Council Clerk: [Signature] *This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land is not being subdivided or consolidated. MPD	
1 1.975ha. TOOKE STREET UNION STREET PARKWAY CORLETTE AVENUE 100 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 WARNING: CHEASING OR FOLDING WILL LEAD TO REJECTION			
DP 746132 Registered 1/8 26-3-1987 Title System OLD SYSTEM Purpose ACQUISITION (NOT A SUBDIVISION) Current Plan AT REG N 5923A Rel. Map: U6350-62 Lot Plan: DP 71124 PLAN OF SUBDIVISION OF LOTS 101 & 102 D.P.717124. Reduction Ratio 1:800 Lengths are in metres. City NEWCASTLE Locality COOKS HILL Parish NEWCASTLE County NORTHUMBERLAND Signature [Signature] Surveyor registered under the Surveyors Act, 1929, as amended. Public Works Department, Sydney Lot 1 PROPOSED TO BE ACQUIRED SURVEYOR'S REFERENCE: S.B. 31891			

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 26th March, 1987

[Seal]

SIGNATURE AND SEALS ONLY.

SIGNED BY *[Signature]*
DELEGATE OF THE MINISTER FOR EDUCATION
AND TRAINING UNDER INSTRUMENT OF
DELEGATION GIVEN IN ACCORDANCE WITH
SECTION 29 OF THE TECHNICAL AND FURTHER
EDUCATION COMMISSION ACT, 1990.

Crown Lands Office Approval

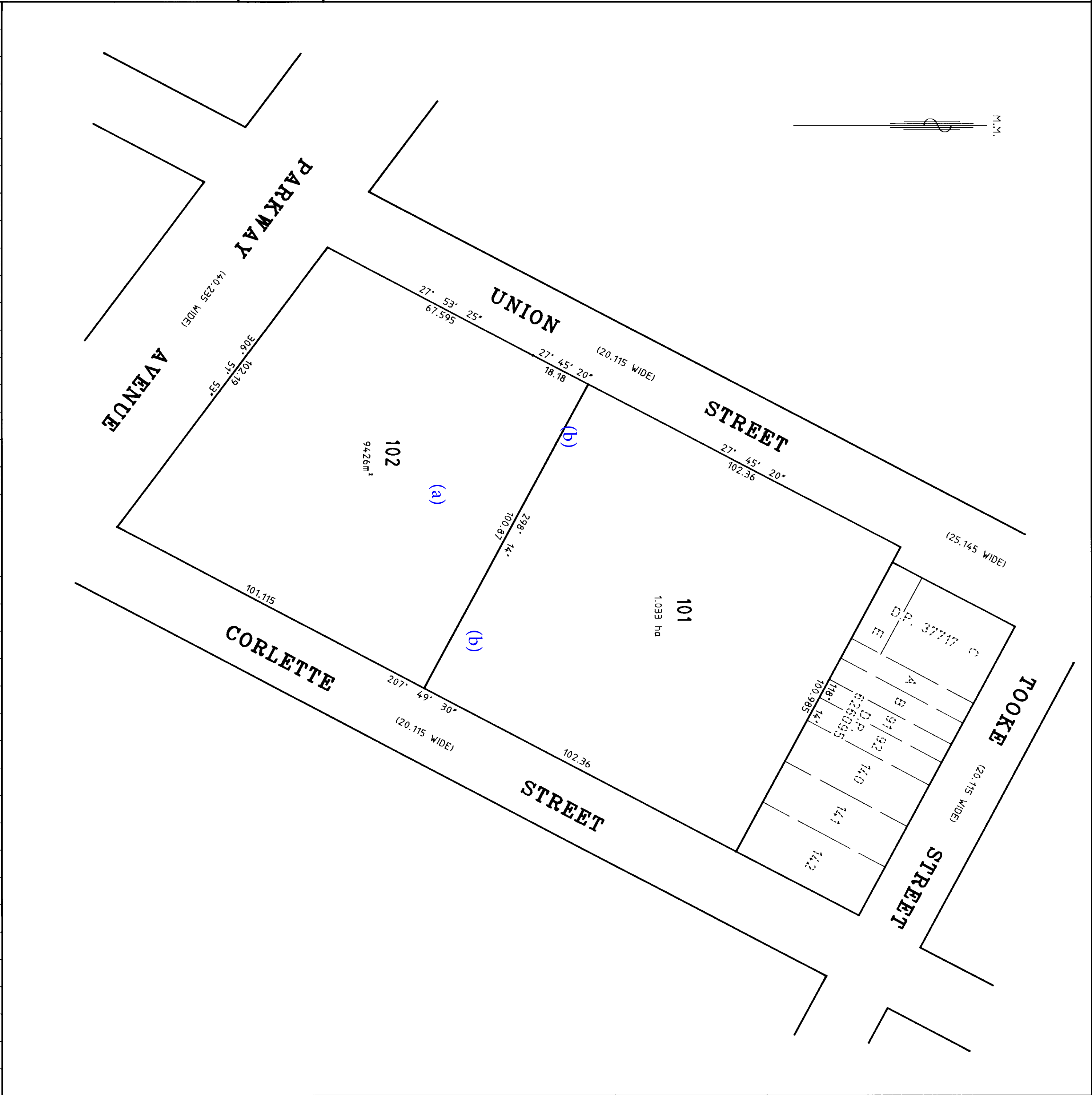
PLAN APPROVED
Authorised Officer

Land District:
Paper No.
Field Book:
page:

Council's Certificate

I hereby certify that -
(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and
(b) the requirements of Part 3 Division 2 of the Water Board Act 1987 of Part 3 Division 7 of the Hunter Water Board (Incorporation) Act 1981
have been complied with by the applicant in relation to the proposed
[insert "new road", "subdivision" or "consolidated lot"] set out herein
Subdivision No.
Date:
(Signature)
General Manager / authorised person
Council File No.

*The part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the area of operations of the Metropolitan Water Sewerage and Drainage Board and the Hunter Water Corporation Ltd.
† Delete if inapplicable.



DP 861562

Registered: *[Signature]* 19-8-1996

C.A.:

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: U6350-62# 623#, 624#

Last Plan: DP746132

PLAN OF SUBDIVISION OF
LOT 1 D.P. 746132.

Lengths are in metres. Reduction Ratio 1:800

L.G.A. NEWCASTLE

Locality: COOKS HILL

Parish: NEWCASTLE

County: NORTHUMBERLAND

This is Sheet 1 of my plan in sheets
(Delete if inapplicable)

I, GREGORY MANNING BURNITT
of MONTEATH & POWYS PTY. LTD.,
a surveyor registered under the Surveyors Act, 1929, hereby
certify that the survey represented in this plan is accurate, has
been made in accordance with the Survey Practice Regulation
1990 and was completed on 9TH JULY 1996.
LOTS 101 & 102 HAVE BEEN COMPILED
FROM D.P. 717124.

(Signature) *Gregory Burnitt*
Surveyor Registered under
the Surveyors Act, 1929

Plans used in preparation of survey/compilation.
D.P. 746132
D.P. 717124

PANEL FOR USE ONLY for statements of intention to
dedicate public roads, to create public reserves, drainage
reserves, easements, restrictions on the use of land or
positive covenants.

SURVEYOR'S REFERENCE: 96/128 CHECKLIST

COMP: 96-384

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

NOTIFICATION OF RESUMPTION OF LAND UNDER THE PUBLIC WORKS ACT, 1912.

IT is hereby notified and declared by His Excellency the Lieutenant-Governor, acting with the advice of the Executive Council, that so much of the land hereunder described as is Crown land has been appropriated, and so much thereof as is private property has been resumed, under the Public Works Act, 1912, for the following public purpose, namely, a Public School at **COOK'S HILL**, and is vested in the Minister of Public Instruction on behalf of His Majesty the King for the purposes of the Public Instruction Act of 1880.

Dated the fifteenth day of May, one thousand nine hundred and forty-six.

F. JORDAN, Lieutenant-Governor.

By His Excellency's Command,

R. J. HEFFRON, Minister of Public Instruction.

DESCRIPTION OF LAND REFERRED TO.

All that piece or parcel of land situate in the City of Greater Newcastle, parish of Newcastle, county of Northumberland and State of New South Wales, being lots 71 and 72 of section L of the Australian Agricultural Company's Subdivision, and also being the whole of the land comprised in Deed of Conveyance number 789, book 1,816,—having an area of 3 acres and 1 3/20th perch or thereabouts, and said to be in the possession of W. E. Bramble and Sons Pty. Limited.

Also, all that piece or parcel of land situate as above, being lots 163 to 174 of section L in registered plan 835,—having an area of 1 acre 3 roods and 19 8/10th perches or thereabouts, and said to be in the possession of the Australian Agricultural Company. (7905)

**TECHNICAL AND FURTHER EDUCATION ACT 1974—
PUBLIC WORKS ACT 1912**

ACQUISITION OF LAND

Technical College at Newcastle

IN pursuance of the provisions of section 28 of the Technical and Further Education Act 1974, it is hereby notified and declared by His Excellency the Governor, acting with the advice of the Executive Council, that so much of the land described in the Schedule hereto as is Crown land is hereby appropriated, and so much of the said land as is private property is hereby resumed, under the Public Works Act 1912, for the purpose of a Technical College at Newcastle; and that the said land is vested in the Minister for Education as Constructing Authority on behalf of Her Majesty the Queen.

Dated at Sydney, this twelfth day of August, in one thousand nine hundred and eighty-seven.

J. A. ROWLAND, Governor.

By His Excellency's Command,

R. M. CAVALIER, Minister for Education.

THE SCHEDULE

All that piece or parcel of land situated in the City of Newcastle, Parish of Newcastle and County of Northumberland, being lot 1, Deposited Plan 746132, having an area of 1.975 hectares or thereabouts, and said to be in the possession of the Minister of Public Instruction. (SB31891) (84/R/0561) (87)



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

23/2/2021 6:01PM

FOLIO: 102/861562

First Title(s): OLD SYSTEM

Prior Title(s): 1/746132

Recorded	Number	Type of Instrument	C.T. Issue
19/8/1996	DP861562	DEPOSITED PLAN	FOLIO CREATED EDITION 1
9/1/1998	3721228	TRANSFER	
9/1/1998	3721229	MORTGAGE	EDITION 2
17/5/2010	AF495657	DEPARTMENTAL DEALING	
5/8/2010	AF675585	DEPARTMENTAL DEALING	
27/4/2011	AG193924	CAVEAT	
3/6/2011	AG278175	DEPARTMENTAL DEALING	
6/6/2011	DP1165476	DEPOSITED PLAN	EDITION 3
2/9/2018	AN678864	DEPARTMENTAL DEALING	EDITION 4 CORD ISSUED

*** END OF SEARCH ***

advlegs

PRINTED ON 23/2/2021

RP 36

Crown Instrument not liable to Stamp Duty
or payment of Registration or other fees.

H. K. ROBERTS

Crown Solicitor

123



RESUMPTION APPLICATION

Section 31A (2) Real Property Act, 1900

RA

	of	
\$ OHMS		

DESCRIPTION
OF LAND

Note (a)

Lot No.	Plan No.	Location
1	746132	PH: Newcastle CO: Northumberland

DESCRIPTION OF
EASEMENT

Note (b)

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
	WHOLE	

APPLICANT

Note (c)

<u>THE MINISTER FOR EDUCATION</u>

GAZETTAL

Note (d)

(the abovenamed Applicant) in consequence of the resumption notified in Government Gazette dated 28th August 1987, folio 4943 a true copy whereof is attached hereto, hereby applies to the Registrar General

EASEMENT

Note (e)

(i) for the issue of a certificate of title in favour of the applicant,

~~(ii) for the issue of a certificate of title in favour of the applicant,~~

Note (f)

so resumed on the folio(s) of the Register, described in the above schedule.

And I HUGH KING ROBERTS, State Crown Solicitor hereby certify that

Note (c)

(1) I am authorised to make the within application;

(2) the said land has not been divested from the applicant THE MINISTER FOR EDUCATION and no estate or interest therein has been created in favour of any other person.

(3) the said land is not under the provisions of the Real Property Act, 1900, and no sale, lease or other transaction affecting it is intended to be completed prior to the issue of the folio of the Register; and

(4) this application is correct for the purposes of the Real Property Act, 1900.

(Copy of Gazette notification.)

See Annexure Hereto.

Dated

this 17th day of December, 1987.

Signed in my presence

EXECUTION

Note (g)

by the said HUGH KING ROBERTS, State Crown Solicitor,
Solicitor for the applicant by JOHN ANTHONY MAHONEY State
Crown Solicitor's Office who is personally known to me:

B.B. Phillips
Signature of Witness

H. K. ROBERTS
State Crown Solicitor
per

[Signature]
Signature

B. B. PHILLIPS
Name of Witness (BLOCK LETTERS)

87/4762 C8/JR

TO BE COMPLETED
BY LODGING PARTY
Notes (h)
and (i)

Passed	Stamp By	LOCATION OF DOCUMENTS		DELIVERY DIRECTIONS	
	STATE CROWN SOLICITORS OFFICE	CT	OTHER		
	GOODSELL BUILDING		Herewith		
Checked	8-12 CHIFLEY SQUARE, SYDNEY. 2000		In R.G.O. with		
	DX 19 PHONE: 238-7406		Produced by		
	Delivery Box Number 813E				

RP 36

For use where the land and/or easement is not under the provisions of the Real Property Act, 1900.

INSTRUCTIONS FOR COMPLETION

Use this form where the land resumed is not under the Real Property Act, 1900.

Typewriting and handwriting should be clear, legible and in permanent non-copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the authorised officer.

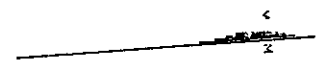
If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the authorised officer and attesting witness.

The following instructions relate to the side notes on the form.

- (a) (i) The lot and plan number or portion.
 (ii) Insert the locality shown on the plan, e.g. at Chullora. If the locality is not shown, insert the Parish and County, e.g. Ph. Lismore Co. Rous.
- (b) (i) Insert the current Folio Identifier or Volume and Folio of the Certificate of Title/Crown Grant of the servient tenement.
 (ii) Insert the locality shown on the Certificate of Title/Crown Grant.
 (iii) A resumption application may not be made for the creation of a folio of the Register for an easement alone (see section 31A (2B) of the Real Property Act, 1900).
- (c) State the name of the authority in which the land is vested.
- (d) Show date and folio number of Gazette notification.
- (e) (i) Rule through if not applicable.
 (ii) State the nature of the easement (see e.g. section 181A of the Conveyancing Act, 1919) and delete inappropriate words.
- (f) Name of authorised officer.
- (g) EXECUTION—The certificate of correctness under the Real Property Act, 1900 must be signed by an authorised officer of the applicant. Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.
- (h) Insert the name, postal address, Document Exchange reference, telephone number and Delivery Box number of the lodging party.
- (i) If any document is lodged with this application, record in DOCUMENTS LODGED panel.
- (j) Insert a copy of the Gazette notification. If the space provided is insufficient for this purpose, use an annexure sheet (identified as such) of the same size and quality paper as this form.

OFFICE USE ONLY

FIRST SCHEDULE DIRECTIONS				
(A) FOLIO IDENTIFIER	(B) DIRECTION	(C) NAME		
SECOND SCHEDULE & OTHER DIRECTIONS				
(D) FOLIO IDENTIFIER	(E) DIRECTION	(F) NOTFN TYPE	(G) DEALING NUMBER	(H) DETAILS



Requiescat MS 26-3-1987 C&C

9. ^{9.000000} ACQUISITION (NOT A
CURRENT PLAN AT REG'N \$127A)

DP 717124

PLAN OF SUBDIVISION OF
LOTS 101 & 102 D.P. 717124

Retention Ratio 1 800

Logins are in metadata

~~Manchester~~
City
NEWCASTLE

Locality: COOKS HILL

Parish: **NEWCASTLE**

COUNTY. NORTHUMBERLAND

Online Appendix

WILLIAM CHARLES IV

2 Slaves registered under the Slave Act

06. COMPILATION

Practice Regulations, 1977, and was compiled
D1241007

Signature:

Surveyor registered under Surveyors Act, 19
Datum Line of Adamu.

Q. What was the other statement of

to dedicate public roads or to create
easels, drainage reserves, easements or

1000

LOI 1 PROPOSED
ACCOMPLISHED

1

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1

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ANNEXURE TO RESUMPTION APPLICATION DATED

by the State Crown Solicitor

17/12/87.



[Published in Government Gazette No. 136 of 28th
August, 1987, on page 4943.]

TECHNICAL AND FURTHER EDUCATION ACT 1974—
PUBLIC WORKS ACT 1912
ACQUISITION OF LAND

Technical College at Newcastle

IN pursuance of the provisions of section 28 of the Technical and Further Education Act 1974, it is hereby notified and declared by His Excellency the Governor, acting with the advice of the Executive Council, that so much of the land described in the Schedule hereto as is Crown land is hereby appropriated, and so much of the said land as is private property is hereby resumed, under the Public Works Act 1912, for the purpose of a Technical College at Newcastle; and that the said land is vested in the Minister for Education as Constructing Authority on behalf of Her Majesty the Queen.

Dated at Sydney, this twelfth day of August, in one thousand nine hundred and eighty-seven.

J. A. ROWLAND, Governor.

By His Excellency's Command,

R. M. CAVALIER, Minister for Education.

THE SCHEDULE

All that piece or parcel of land situated in the City of Newcastle, Parish of Newcastle and County of Northumberland, being lot 1, Deposited Plan 746132, having an area of 1.975 hectares or thereabouts, and said to be in the possession of the Minister of Public Instruction. (SB31891) (84/R/0561)

(87)

D. West, Government Printer, New South Wales—1987

Authorised Officer: _____

Witness: _____



NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 102/861562

SEARCH DATE	TIME	EDITION NO	DATE
-----	----	-----	----
23/2/2021	6:01 PM	4	2/9/2018

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY COMMONWEALTH BANK OF AUSTRALIA.

LAND

LOT 102 IN DEPOSITED PLAN 861562
AT COOKS HILL
LOCAL GOVERNMENT AREA NEWCASTLE
PARISH OF NEWCASTLE COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP861562

FIRST SCHEDULE

NEWCASTLE GRAMMAR SCHOOL LTD (T 3721228)

SECOND SCHEDULE (3 NOTIFICATIONS)

1	3721229	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
2	DP1165476	EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 3.3 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1165476
3	DP1165476	EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 1.5 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1165476

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

advlegs

PRINTED ON 23/2/2021

Appendix F - Section 149 Certificate



City of
Newcastle

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Coffey Services Australia
16 Callistemon Close
Warabrook NSW 2304

Certificate No: PL2021/01037
Fees: \$231.75
Receipt No(s): D001824179

Your Reference: NGS-10.7

Date of Issue: 23/02/2021

The Land: Lot 102 DP 861562 127 Union Street Cooks Hill NSW 2300
--

Advice provided on this Certificate:

Advice under section 10.7(2): see items 1 – 21
Additional advice under section 10.7(5): see Items 22 – 28

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

Please check for any item which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, phone our **Customer Contact Centre** on (02) 4974 2000, or come in and see us.

The information provided in this certificate relates only to the land described above. If you need information about adjoining or nearby land, or about the City of Newcastle (CN) development policies for the general area, contact our **Customer Contact Centre**.

All information provided is correct as at 23/02/2021. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

Phone: (02) 4974 2000
Facsimile: (02) 4974 2222

Customer Contact Centre

Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:

Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

ATTENTION: The explanatory notes appearing in italic print within Part 1 are provided to assist understanding, but do not form part of the advice provided under section 10.7(2). These notes shall be taken as being advice provided under section 10.7(5).

1. Names of relevant planning instruments and DCPs

The following environmental planning instruments, proposed environmental planning instruments and development control plans apply to the land, either in full or in part.

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

State Environmental Planning Policy No. 33 - Hazardous and Offensive Development

State Environmental Planning Policy No. 36 - Manufactured Home Estates

State Environmental Planning Policy (Koala Habitat Protection) Amendment (Maps) 2020

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

State Environmental Planning Policy No. 65 - Design Quality of Residential Flat Development

State Environmental Planning Policy No. 70 - Affordable Housing (Revised Schemes)

State Environmental Planning Policy (Housing For Seniors or People with a Disability) 2004

State Environmental Planning Policy (Building Sustainability Index:BASIX) 2004

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

State Environmental Planning Policy (Concurrences) 2018

State Environmental Planning Policy (Primary Production and Rural Development) 2019

Newcastle Local Environmental Plan 2012

Newcastle Development Control Plan 2012

2. Zoning and land use under relevant LEPs

Newcastle Local Environmental Plan 2012

Zoning: The Newcastle Local Environmental Plan 2012 identifies the land as being within the following zone(s):

Zone R3 Medium Density Residential

Note: Refer to www.newcastle.nsw.gov.au or www.legislation.nsw.gov.au website for LEP instrument and zoning maps.

The following is an extract from the zoning provisions contained in Newcastle Local Environmental Plan 2012:

Zone R3 Medium Density Residential

- **Objectives of zone**

- To provide for the housing needs of the community within a medium density residential environment.
- To provide a variety of housing types within a medium density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To allow some diversity of activities and densities if:
 - (i) the scale and height of proposed buildings is compatible with the character of the locality, and
 - (ii) there will be no significant adverse impact on the amenity of any existing nearby development.
- To encourage increased population levels in locations that will support the commercial viability of centres provided that the associated new development:
 - (i) has regard to the desired future character of residential streets, and
 - (ii) does not significantly detract from the amenity of any existing nearby development.

- **Permitted without consent**

Environmental protection works; Home occupations

- **Permitted with consent**

Attached dwellings; Boarding houses; Car parks; Centre based child care facilities; Community facilities; Educational establishments; Emergency services facilities; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Health services facilities; Home-based child care; Home businesses; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Recreation areas; Residential accommodation; Respite day care centres; Roads; Seniors housing; Tank-based aquaculture; Tourist and visitor accommodation

- **Prohibited**

Pond-based aquaculture; Any development not specified in, permitted without consent or permitted with consent

Minimum land dimensions for erection of a dwelling-house: The Newcastle Local Environmental Plan 2012 contains development standards relating to minimum land dimensions for the erection of a dwelling house. Refer to clause 4.1 Minimum subdivision lot size and Part 4 Principle development standards of the Newcastle LEP 2012 for provisions relating to minimum lot sizes for residential development.

Critical habitat: The Newcastle Local Environmental Plan 2012 does not identify the land as including or comprising critical habitat.

Heritage conservation area: The land is not within a heritage conservation area under the Newcastle Local Environmental Plan 2012.

Heritage items: There are no heritage items listed in the Newcastle Local Environmental Plan 2012 situated on the land.

3. Complying development

Note Other requirements: The advice below for all Complying Development Codes, is limited to identifying whether or not the **land**, the subject of the certificate, is land on which complying development may be carried out because of Clauses 1.17A(1)(c) to (e), (2), (3) & (4), 1.18 (1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 (the Codes SEPP).

To ascertain the extent to which the complying development may or may not be carried out on the land, maps are available on City of Newcastle (CN) web pages.

Housing Code

Complying development under the Housing Code MAY be carried out on this land.

Rural Housing Code

Complying development under the Rural Housing Code MAY be carried out on this land.

Low Rise Housing Diversity Code

Complying development under the Low Rise Housing Diversity Code MAY be carried out on this land.

Greenfield Housing Code

Complying development under the Greenfield Housing Code MAY be carried out on this land.

Inland Code

Complying development under the Inland Code MAY be carried out on this land.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY be carried out on this land.

General Development Code

Complying development under the General Development Code MAY be carried out on this land.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Code MAY be carried out on this land.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY be carried out on this land.

Container Recycling Facilities Code

Complying development under the Container Recycling Facilities Code MAY be carried out on this land.

Subdivision Code

Complying development under the Subdivision Code MAY be carried out on this land.

Demolition Code

Complying development under the Demolition Code MAY be carried out on this land.

Fire Safety Code

Complying development under the Fire Safety Code MAY be carried out on this land.

4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

The land IS NOT subject to an agreement for annual charges under section 496B of the Local Government Act 1993 for coastal protection services (within the meaning of section 553B of that Act).

5. Coal Mine Subsidence Compensation Act 2017

The land IS WITHIN a declared Mine Subsidence District under section 20 of the Coal Mine Subsidence Compensation Act 2017. Development in a Mine Subsidence District requires approval from Subsidence Advisory NSW. Subsidence Advisory NSW provides compensation to property owners for mine subsidence damage. To be eligible for compensation, development must be constructed in accordance with Subsidence Advisory NSW approval. Subsidence Advisory NSW has set surface development guidelines for properties in Mine Subsidence Districts that specify building requirements to help prevent potential damage from coal mine subsidence.

NOTE: The above advice is provided to the extent that City of Newcastle (CN) has been notified by Subsidence Advisory NSW.

6. Road widening or realignment

NOTE: The Roads and Maritime Services (RMS) may have proposals that are not referred to in this item. For advice about affectation by RMS proposals, contact the Roads and Maritime Services, Locked Mail Bag 30 Newcastle 2300. Ph: 131 782.

The land IS NOT AFFECTED by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993.

The land IS NOT AFFECTED by any road widening or road realignment under an environmental planning instrument.

The land IS NOT AFFECTED by road widening or road realignment under a resolution of the Council.

7. Policies on hazard risk restrictions

Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Potential acid sulfate soils: Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.

Land Contamination: Council has adopted a policy of restricting development or imposing conditions on properties affected by Land Contamination. Refer to the Newcastle Development Control Plan 2012, which is available to view and download from City of Newcastle's website.

NOTE: The absence of a policy to restrict development of the land because of the likelihood of a particular risk does not imply that the land is free from that risk. City of Newcastle (CN) considers the likelihood of natural and man-made risks when determining development applications under section 4.15 of the Environmental Planning and Assessment Act 1979. Detailed investigation carried out in conjunction with the preparation or assessment of a development application may result in CN either refusing development consent or imposing conditions of consent on the basis of risks that are not identified above.

7A. Flood related development controls information

Our information currently indicates that the property is, or contains, flood prone land as defined in the Floodplain Development Manual: the management of flood liable land, April 2005 published by the NSW Government.

Section 4.01 Flood Management of Newcastle Development Control Plan (DCP) 2012 provides guidelines with respect to all development of flood prone land. This includes development for the purpose of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings. The DCP may be viewed on our website, inspected or purchased at our Customer Contact Centre.

NOTE: More detailed flood information specific to the property is available on separate flooding certificate application through our Customer Contact Centre on (02) 4974 2000

8. Land reserved for acquisition

The land is not identified for acquisition by a public authority (as referred to in section 3.15 of the Act) by any environmental planning instrument or proposed environmental planning instrument applying to the land.

9. Contributions plans

The following contribution plan/s apply to the land.

Section 7.12 Newcastle Local Infrastructure Contributions Plan 2019: Effective 9 September 2019.

The Plan specifies section 7.12 contributions that may be imposed as a condition of development consent.

NOTE: Contributions plans are available on our website or may be inspected or purchased at our Customer Contact Centre.

9A. Biodiversity certified land

The land IS NOT biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

10. Biodiversity stewardship sites

The land IS NOT land (of which CN is aware) under a biodiversity stewardship agreement under Part 5 of the Biodiversity Conservation Act 2016.

10A. Native vegetation clearing set asides

The land IS NOT land (of which CN is aware) that contains a set aside area under section 60ZC of the Local Land Services Act 2013.

11. Bush fire prone land

The land IS NOT bush fire prone land for the purposes of the Environmental Planning and Assessment Act 1979.

12. Property vegetation plans

Not applicable. The Native Vegetation Act 2003 does not apply to the Newcastle local government area.

13. Orders under Trees (Disputes Between Neighbours) Act 2006

CN HAS NOT been notified that an order has been made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14. Directions under Part 3A

The land IS NOT AFFECTED by a direction by the Minister in force under section 75P (2) (c1) of the Act.

15. Site compatibility certificates and conditions for seniors housing

(a) The land IS NOT AFFECTED by a current site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004.

(b) The land IS NOT AFFECTED by any terms of kind referred to in clause 18(2) of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, that have been imposed as a condition of consent to a development application granted after 11 October, 2007 in respect of the land.

16. Site compatibility certificates for infrastructure, schools or TAFE establishments

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Infrastructure) 2007.

17. Site compatibility certificates and conditions for affordable rental housing

The land IS NOT AFFECTED by a valid site compatibility certificate (of which CN is aware) issued under the State Environmental Planning Policy (Affordable Rental Housing) 2009.

18. Paper subdivision information

The land IS NOT AFFECTED by any development plan that applies to the land or that is proposed to be subject to a consent ballot.

19. Site verification certificates

The land IS NOT AFFECTED by a current site verification certificate (of which CN is aware) issued under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20. Loose-fill asbestos insulation

CN HAS NOT been notified that the land includes any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that Division.

21. Affected building notices and building product rectification orders

The land IS NOT AFFECTED by any affected building notice of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by any building product rectification order that has not been fully complied with, of which CN is aware that is in force in respect of the land.

The land IS NOT AFFECTED by an outstanding notice of intention to make a building product rectification order of which CN is aware.

An affected building notice has the same meaning as in Part 4 of the Building Products (Safety) Act 2017.
Building product rectification order has the same meaning as in the Building Products (Safety) Act 2017.

Note: *There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*

Part 2:

Advice provided under section 10.7(5)

ATTENTION: *Section 10.7(6) of the Act states that a Council shall not incur any liability in respect of advice provided in good faith pursuant to sub-section 10.7(5).*

22. Outstanding Notices and Orders issued by City of Newcastle (CN).

Our records indicate that this premise IS NOT AFFECTED by a current notice or order (excluding the notices or orders mentioned in the note below).

NOTE: *CN has not inspected the premises immediately prior to the issue of this certificate. It is possible that the premises are affected by matters of which we are unaware.*

NOTE: *This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979 or the Local Government Act 1993. To obtain advice regarding these matters, you should lodge an application for a Certificate as to Outstanding Notices and Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.*

23. Draft development control plans.

A draft development control plan DOES NOT APPLY to the land. The draft plans are exhibited pursuant to Part 3 of the Environmental Planning and Assessment Regulation 2000.

24. Heritage Act 1977.

The land IS NOT AFFECTED by a listing on the State Heritage Register or an Interim Heritage Order that is in force under the Heritage Act 1977.

NOTE: *The above advice is provided to the extent that CN has been notified by the Heritage Council of NSW. For up-to-date details, contact the Office of Environment and Heritage, PO Box A290, South Sydney NSW 1232 Ph: (02) 9995 5000.*

25. Listing by National Trust of Australia.

The land IS NOT AFFECTED by a listing of the National Trust of Australia (NSW).

NOTE: The above advice is provided to the extent that CN has been notified by the National Trust of Australia (NSW). For up-to-date details, contact the National Trust Ph 02 9258 0123.

26. Australian Heritage Database.

The land IS NOT AFFECTED by a listing on the Australian Heritage Database.

NOTE: The above advice is provided to the extent that CN has been notified by the Department of the Environment. For up-to-date details, contact the Department of the Environment, Heritage, King Edward Terrace, Parkes ACT 2600. Ph (02) 6274 1111.

27. Environment Protection & Biodiversity Conservation Act 1999 (Cth)

Under the (Commonwealth) Environment Protection and Biodiversity Conservation Act 1999, actions which have, may have or are likely to have, a significant impact on a matter of national environmental significance may be taken only with the approval of the Commonwealth Minister for the Environment.

Approval is also required for actions that have a significant effect on the environment of Commonwealth land. These actions may be on Commonwealth land or other land.

This approval is in addition to any approvals under the (NSW) Environmental Planning and Assessment Act 1979 or other NSW legislation.

Matters of national environmental significance are:

- declared World Heritage areas
- declared Ramsar wetlands
- listed threatened species and ecological communities
- listed migratory species
- nuclear actions
- the environment of Commonwealth marine areas.

Locations within the City of Newcastle that are a declared Ramsar wetland include Kooragang Nature Reserve and Shortland Wetlands. Listed threatened species and listed migratory species are known to occur within the City of Newcastle.

28. Other matters

The land is affected by the following:

Live Music Strategy (2019) and Newcastle After Dark: Night-time Economy Strategy (2018-2022).

City of Newcastle's Live Music Strategy and Newcastle After Dark: Night Time Economy Strategy supports live music and the night-time economy which play a key role in accommodation, events, cultural and business uses in the City Centre and Town Centres. Future residents should be aware that these uses may generate noise, odour, traffic and have longer hours of operation, including after 5pm, which is part of living in/near a commercial centre. The Strategies promote the sharing of the City, including the mitigation of impacts of new residential development, live music or the night time economy on other land uses.

For more information see Live Music Strategy (2019) and Newcastle After Dark: Night-Time Economy Strategy (2018-2022) on Council's website <https://www.newcastle.nsw.gov.au> or phone 4974 2000.

Newcastle earthquake

Earthquakes occurred in the vicinity of Newcastle on 28th December 1989 and 6 August 1994. Buildings on the land may have suffered damage as a consequence of the earthquakes. Prospective purchasers are advised to make their own enquiries as to whether the property is affected by any damage.

Further consent requirements under the Newcastle Local Environmental Plan 2012.

The following provisions of the Newcastle Local Environmental Plan 2012 affect the carrying out of development on the land. These provisions are in addition to those required to be disclosed at Item 2 of this Certificate.

Refer to clause 3.1 Exempt Development of the Newcastle Local Environmental Plan 2012

Refer to clause 3.2 Complying Development of the Newcastle Local Environmental Plan 2012

Local Strategic Planning Statement

The Local Strategic Planning Statement (LSPS) was adopted by council on 26 May 2020 and replaces the Local Planning Strategy. The LSPS is taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

Hunter Regional Plan 2036

The Hunter Regional Plan has been prepared by the Department of Planning and Environment. The contents of the strategy will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to the Department of Planning and Environment's website to view the document. www.planning.nsw.gov.au

Newcastle City-Wide Floodplain Risk Management Study and Plan (2012)

The Newcastle City-wide Floodplain Risk Management Study and Plan addresses flood management for the City of Newcastle. The Study and Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Note: Refer to our website to view the document. www.newcastle.nsw.gov.au

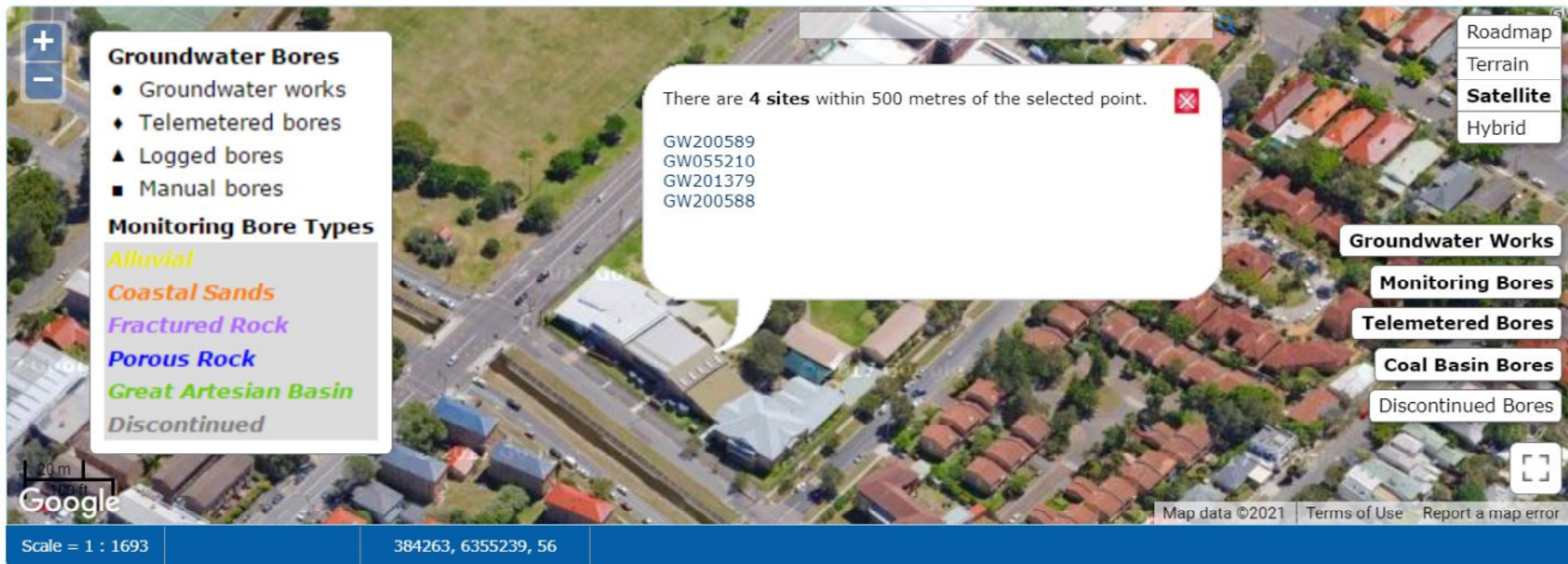
Greater Newcastle Metropolitan Plan 2036

The Greater Newcastle Metropolitan Plan 2036 has been prepared by the Department of Planning and Environment. The Plan will be taken into account when CN assesses development applications and amendments to the Newcastle Local Environmental Plan 2012.

Issued without alterations or additions, 23/02/21
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

Appendix G - Groundwater Bore Search



Appendix H - Contaminated Land Search

Search results

Your search for: LGA: NEWCASTLE CITY COUNCIL

Matched 132 notices relating to 22 sites.

[Search Again](#)

[Refine Search](#)

Suburb	Address	Site Name	Notices related to this site
HAMILTON	116 Tudor STREET	Taxi Services	4 former
HAMILTON NORTH	56 Clyde STREET	Former Black and Decker Site	2 current
HAMILTON NORTH	54 Clyde STREET	Former ELMA Site	1 current and 1 former
HAMILTON NORTH	1 Chatham ROAD	Hamilton Gasworks	3 current and 7 former
HAMILTON NORTH	5 Chatham ROAD	Shell Newcastle Terminal	2 current and 2 former
HEXHAM	21 Sparke STREET	Former Forgacs Site	1 current
HEXHAM	64 Old Maitland ROAD	Trojay Pty Ltd	1 current
KOORAGANG	Cormorant ROAD	BHP Kooragang	1 current and 1 former
KOORAGANG	15 Greenleaf ROAD	Orica Kooragang Island	5 current and 11 former
MARYVILLE	184-188 Hannell STREET	7-Eleven Service Station	2 current and 1 former
MAYFIELD	The Buffer Zone' extending directly adjacent to the Hunter River; near the Tourle Street Bridge STREET	BHP Steel River	3 current and 1 former
MAYFIELD	Industrial DRIVE	OneSteel (BHP)	2 current and 5 former
MAYFIELD NORTH	Bound by Hunter River, Selwyn Street & Industrial DRIVE	Former BHP Steelworks (Closure site)	4 current and 23 former
MAYFIELD NORTH	Industrial DRIVE	Former BHPB Supply site	2 current and 11 former
MAYFIELD WEST	East of Woodstock Street and Tourle STREET	Koppers Coal Tar	2 current and 6 former
NEWCASTLE	26-28 Honeysuckle DRIVE	Reclaimed Land	1 former
SANDGATE	Maitland ROAD	North Limited Storage Handling facility	1 current and 7 former
SHORTLAND	2 (part) & 28 (part) Astra STREET	Former Astra Street Landfill	4 current and 4 former
TARRO	Woodland CLOSE	Green Acres Farm	1 current
TIGHES HILL	110 Elizabeth STREET	Former Mobil Terminal	6 former

[Home](#) [Public registers](#) [Contaminated land record of notices](#)

Search results

Your search for: LGA: NEWCASTLE CITY COUNCIL

Matched 132 notices relating to 22 sites.

[Search Again](#)

[Refine Search](#)

Suburb	Address	Site Name	Notices related to this site
WICKHAM	156 Hannell Street and 33 Annie STREET	Caltex Terminal and "Building 33" on offsite adjacent land	3 current
WICKHAM	2 Holland STREET	Fuchs Lubricants Wickham	2 current

[1](#) [2](#)

Appendix I - Site Photographs



Photograph 1:
View north east - Surface conditions along the eastern perimeter boundary



Photograph 2:
View west from the eastern perimeter boundary. Basketball court surface conditions



Photograph 3:
View East - Medium density residential dwelling opposite Corlette Street



Photograph 4:
View south east - Medium density residential dwellings and concrete stormwater drain Cottage Creek



Photograph 5:
View south - Main pedestrian entrance, Parkway Avenue.



Photograph 6:
View west - Landscaped garden and building conditions of auditorium observed in good condition



Photograph 7:
View north-west - playground conditions observed at time of walkover



Photograph 8:
View south west - Concrete and playground surface conditions. Main auditorium building in background



Photograph 9:
View south - Conditions observed along the sites western perimeter boundary



Photograph 10:
View north east - Concrete pathway with trees observed in good health along the sites northern perimeter boundary



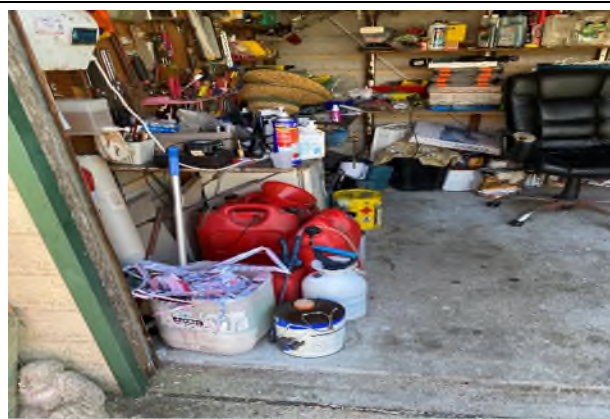
Photograph 11:
View South-east - Surface conditions, fresh grassed vegetation



Photograph 12:
Lawn maintenance equipment used by groundskeepers. ULP powered lawn mower, blower and edger.



Photograph 13:
Conditons observed withing groundkeepers shed (garage).



Photograph 14:
Conditons observed withing groundkeepers shed (garage). No cracks or damage observed to concrete lined floor. No leaks or spills observed from any contained chemicals.



Photograph 15:
View west - Conditions at the rear of the administration building along the northern perimeter boundary



Photograph 16:
View west - Landscaped garden observed in the centre of the playground area

Appendix J - NATA Accredited Laboratory Reports

[illegible]

coffey
A TETRA TECH COMPANY

Email: newcastle@coffey.com

[illegible]

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

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

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448

New Zealand

Auckland
35 O'Rorke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: Coffey Environments P/L N'castle
Contact name: Craig Schrader
Project name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700
Turnaround time: 5 Day
Date/Time received: Jan 20, 2021 11:22 AM
Eurofins reference: 768512

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 17.2 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✓ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

QC2 & QC4 forwarded to ALS for analysis. BH4-1.4-1.6 & BH10-0.5-0.6 - no bag received, applicable analysis cancelled. BH4 sample depths updated as per jar.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Craig Schrader - craig.schrader@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments P/L N'castle email address.

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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NATA # 1261 Site # 18217

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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

Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448

New Zealand

Auckland
35 O'Rourke Road
Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
Due: Jan 28, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	BH1-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20254	X		X	X		
2	BH1-0.6-0.8	Jan 15, 2021		Soil	S21-Ja20255	X					
3	BH1-3.2-3.4	Jan 15, 2021		Soil	S21-Ja20256			X	X		
4	BH2-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20257			X	X		
5	BH2-2.8-3.0	Jan 15, 2021		Soil	S21-Ja20258			X	X		
6	BH3-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20259	X		X	X		
7	BH3-0.4-0.6	Jan 15, 2021		Soil	S21-Ja20260	X		X	X		
8	BH3-1.5-1.7	Jan 15, 2021		Soil	S21-Ja20261			X	X		
9	BH4-0.3-0.5	Jan 15, 2021		Soil	S21-Ja20262			X	X		

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NATA # 1261
Site # 23736

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New Zealand

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Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
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Priority: 5 Day
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Eurofins Analytical Services Manager : Andrew Black

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Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
10	BH4-1.4-1.6	Jan 15, 2021		Soil	S21-Ja20263			X	X		
11	BH5-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20264	X					
12	BH5-0.3-0.5	Jan 15, 2021		Soil	S21-Ja20265	X		X	X		
13	BH5-1.0-1.2	Jan 15, 2021		Soil	S21-Ja20266			X	X		
14	BH6-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20267			X	X		
15	BH6-1.6-1.9	Jan 15, 2021		Soil	S21-Ja20268			X	X		
16	BH7-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20269			X	X	X	
17	BH7-0.5-0.6	Jan 15, 2021		Soil	S21-Ja20270			X	X	X	
18	BH8-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20271			X	X		
19	BH8-0.5-0.6	Jan 18, 2021		Soil	S21-Ja20272			X	X		
20	BH9-0.4-0.6	Jan 18, 2021		Soil	S21-Ja20273			X	X	X	

Australia

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NATA # 1261 Site # 18217

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Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

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Phone: 02 4016 2300
Fax: 02 4016 2380

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Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
21	BH9-0.7-0.8	Jan 18, 2021		Soil	S21-Ja20274			X	X	X	
22	BH10-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20275			X	X		
23	BH10-0.5-0.6	Jan 18, 2021		Soil	S21-Ja20276			X	X		
24	QC1	Jan 18, 2021		Soil	S21-Ja20277			X	X		
25	QC3	Jan 18, 2021		Soil	S21-Ja20278			X	X		
26	TB	Jan 18, 2021		Soil	S21-Ja20279						X
27	TS	Jan 18, 2021		Soil	S21-Ja20280						X
28	LAB SPIKE	Jan 18, 2021		Soil	S21-Ja20281						X
29	BH2-0.8-1.0	Jan 15, 2021		Soil	S21-Ja20282		X				
30	BH4-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20283		X				
31	BH6-0.4-0.6	Jan 15, 2021		Soil	S21-Ja20284		X				

Australia

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Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
Due: Jan 28, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
32	BH8-0.3-0.5	Jan 18, 2021		Soil	S21-Ja20285		X				
33	BH9-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20286		X				
34	BH10-0.2-0.4	Jan 18, 2021		Soil	S21-Ja20287		X				
Test Counts						6	6	23	23	4	3

Coffey Environments Pty Ltd Newcastle
16 Callistemon Close
Warabrook
NSW 2304



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Craig Schrader
Report 768512-AID
Project Name **NEWCASTLE GRAMMAR - PSI**
Project ID **754-NTLGE282700**
Received Date Jan 20, 2021
Date Reported Jan 28, 2021

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 fibres 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 fibres 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, possibly 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 AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "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". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name NEWCASTLE GRAMMAR - PSI
Project ID 754-NTLGE282700
Date Sampled Jan 15, 2021
Report 768512-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH1-0.0-0.2	21-Ja20254	Jan 15, 2021	Approximate Sample 119g Sample consisted of: Brown fine-grained sandy soil and organic debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH1-0.6-0.8	21-Ja20255	Jan 15, 2021	Approximate Sample 309g Sample consisted of: Brown coarse-grained sandy soil, sandstone and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH3-0.0-0.2	21-Ja20259	Jan 15, 2021	Approximate Sample 244g Sample consisted of: Brown coarse-grained sandy soil, sandstone and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH3-0.4-0.6	21-Ja20260	Jan 15, 2021	Approximate Sample 356g Sample consisted of: Brown coarse-grained sandy soil, sandstone and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH5-0.0-0.2	21-Ja20264	Jan 15, 2021	Approximate Sample 347g Sample consisted of: Brown coarse-grained clayey-sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH5-0.3-0.5	21-Ja20265	Jan 15, 2021	Approximate Sample 251g Sample consisted of: Brown coarse-grained clayey-sandy soil, sandstone and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos 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.

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

Asbestos - LTM-ASB-8020

Testing Site

Sydney

Extracted

Jan 20, 2021

Holding Time

Indefinite

Australia

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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Received: Jan 20, 2021 11:22 AM
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Contact Name: Craig Schrader

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Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	BH1-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20254	X		X	X		
2	BH1-0.6-0.8	Jan 15, 2021		Soil	S21-Ja20255	X					
3	BH1-3.2-3.4	Jan 15, 2021		Soil	S21-Ja20256			X	X		
4	BH2-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20257			X	X		
5	BH2-2.8-3.0	Jan 15, 2021		Soil	S21-Ja20258			X	X		
6	BH3-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20259	X		X	X		
7	BH3-0.4-0.6	Jan 15, 2021		Soil	S21-Ja20260	X		X	X		
8	BH3-1.5-1.7	Jan 15, 2021		Soil	S21-Ja20261			X	X		
9	BH4-0.3-0.5	Jan 15, 2021		Soil	S21-Ja20262			X	X		

Australia

Melbourne
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NATA # 1261
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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Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
Due: Jan 28, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
10	BH4-1.4-1.6	Jan 15, 2021		Soil	S21-Ja20263			X	X		
11	BH5-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20264	X					
12	BH5-0.3-0.5	Jan 15, 2021		Soil	S21-Ja20265	X		X	X		
13	BH5-1.0-1.2	Jan 15, 2021		Soil	S21-Ja20266			X	X		
14	BH6-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20267			X	X		
15	BH6-1.6-1.9	Jan 15, 2021		Soil	S21-Ja20268			X	X		
16	BH7-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20269			X	X	X	
17	BH7-0.5-0.6	Jan 15, 2021		Soil	S21-Ja20270			X	X	X	
18	BH8-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20271			X	X		
19	BH8-0.5-0.6	Jan 18, 2021		Soil	S21-Ja20272			X	X		
20	BH9-0.4-0.6	Jan 18, 2021		Soil	S21-Ja20273			X	X	X	

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Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
Due: Jan 28, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
21	BH9-0.7-0.8	Jan 18, 2021		Soil	S21-Ja20274			X	X	X	
22	BH10-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20275			X	X		
23	BH10-0.5-0.6	Jan 18, 2021		Soil	S21-Ja20276			X	X		
24	QC1	Jan 18, 2021		Soil	S21-Ja20277			X	X		
25	QC3	Jan 18, 2021		Soil	S21-Ja20278			X	X		
26	TB	Jan 18, 2021		Soil	S21-Ja20279						X
27	TS	Jan 18, 2021		Soil	S21-Ja20280						X
28	BH2-0.8-1.0	Jan 15, 2021		Soil	S21-Ja20282		X				
29	BH4-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20283		X				
30	BH6-0.4-0.6	Jan 15, 2021		Soil	S21-Ja20284		X				
31	BH8-0.3-0.5	Jan 18, 2021		Soil	S21-Ja20285		X				

Australia

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NATA # 1261 Site # 20794

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NATA # 1261
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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
Due: Jan 28, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
32	BH9-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20286		X				
33	BH10-0.2-0.4	Jan 18, 2021		Soil	S21-Ja20287		X				
Test Counts						6	6	23	23	4	2

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. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. 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	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of 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 (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to "non-bonded / friable".
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory's remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

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
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias Senior Analyst-Asbestos (NSW)



Glenn Jackson
General 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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Coffey Environments Pty Ltd Newcastle
16 Callistemon Close
Warabrook
NSW 2304



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Craig Schrader

Report 768512-S
Project name NEWCASTLE GRAMMAR - PSI
Project ID 754-NTLGE282700
Received Date Jan 20, 2021

Client Sample ID			BH1-0.0-0.2	BH1-3.2-3.4	BH2-0.0-0.2	BH2-2.8-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20254	S21-Ja20256	S21-Ja20257	S21-Ja20258
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 15, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	138	61	57	67
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH1-0.0-0.2	BH1-3.2-3.4	BH2-0.0-0.2	BH2-2.8-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20254	S21-Ja20256	S21-Ja20257	S21-Ja20258
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 15, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	66	59	60	74
p-Terphenyl-d14 (surr.)	1	%	86	88	93	87
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.4	3.2	4.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.2	7.8	13	9.1
Copper	5	mg/kg	7.2	27	16	14
Lead	5	mg/kg	8.4	37	56	20
Mercury	0.1	mg/kg	0.3	0.1	0.9	< 0.1
Nickel	5	mg/kg	< 5	< 5	5.3	5.5
Zinc	5	mg/kg	22	33	150	35
% Moisture	1	%	6.7	20	14	16

Client Sample ID			BH3-0.0-0.2	BH3-0.4-0.6	BH3-1.5-1.7	BH4-0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20259	S21-Ja20260	S21-Ja20261	S21-Ja20262
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 15, 2021
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	41
TRH C15-C28	50	mg/kg	60	< 50	< 50	1000
TRH C29-C36	50	mg/kg	53	< 50	< 50	290
TRH C10-C36 (Total)	50	mg/kg	113	< 50	< 50	1331
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	%	86	79	72	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	71
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	71
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	1300

Client Sample ID			BH3-0.0-0.2	BH3-0.4-0.6	BH3-1.5-1.7	BH4-0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20259	S21-Ja20260	S21-Ja20261	S21-Ja20262
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 15, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	110
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	1481
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	48
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	48
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	48
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.0
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.8
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	6.6
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	25
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	32
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	28
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	25
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	20
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	25
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	6.2
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	71
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	3.1
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	23
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.9
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	49
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	66
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	384.6
2-Fluorobiphenyl (surr.)	1	%	73	78	72	76
p-Terphenyl-d14 (surr.)	1	%	92	95	94	50
Heavy Metals						
Arsenic	2	mg/kg	2.4	< 2	9.8	13
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.6
Chromium	5	mg/kg	10	7.4	30	13
Copper	5	mg/kg	9.8	< 5	< 5	50
Lead	5	mg/kg	24	5.5	6.1	150
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	9.7
Zinc	5	mg/kg	56	7.7	< 5	380
% Moisture	1	%	9.6	6.4	16	18

Client Sample ID			BH4-1.4-1.6	BH5-0.3-0.5	BH5-1.0-1.2	BH6-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20263	S21-Ja20265	S21-Ja20266	S21-Ja20267
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 15, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH4-1.4-1.6	BH5-0.3-0.5	BH5-1.0-1.2	BH6-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20263	S21-Ja20265	S21-Ja20266	S21-Ja20267
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 15, 2021
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	79	56	53
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	0.6	< 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	1.1	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	72	65	76	76
p-Terphenyl-d14 (surr.)	1	%	95	93	97	93
Heavy Metals						
Arsenic	2	mg/kg	< 2	3.7	9.4	4.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	7.2	14	7.8
Copper	5	mg/kg	< 5	56	5.3	16
Lead	5	mg/kg	< 5	12	17	18
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	< 5	21	8.7	61
% Moisture	1	%	16	14	9.7	19

Client Sample ID			BH6-1.6-1.9	BH7-0.0-0.2	BH7-0.5-0.6	BH8-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20268	S21-Ja20269	S21-Ja20270	S21-Ja20271
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 18, 2021
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	21	< 200
TRH C15-C28	50	mg/kg	160	< 50	200	< 500
TRH C29-C36	50	mg/kg	92	< 50	110	< 500
TRH C10-C36 (Total)	50	mg/kg	252	< 50	331	< 500
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	%	66	93	69	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 500
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 500
TRH >C16-C34	100	mg/kg	220	< 100	280	< 1000
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 1000
TRH >C10-C40 (total)*	100	mg/kg	220	< 100	280	< 1000
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	5.4	< 0.5	11	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	5.4	0.6	11	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	5.4	1.2	11	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	0.8	< 0.5	2.0	< 0.5
Benz(a)anthracene	0.5	mg/kg	3.5	< 0.5	7.0	< 0.5
Benzo(a)pyrene	0.5	mg/kg	3.6	< 0.5	7.1	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	2.8	< 0.5	5.7	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	1.6	< 0.5	3.8	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	2.7	< 0.5	5.4	< 0.5
Chrysene	0.5	mg/kg	3.2	< 0.5	6.9	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	0.7	< 0.5	1.4	< 0.5
Fluoranthene	0.5	mg/kg	6.2	< 0.5	12	0.8
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	2.0	< 0.5	4.0	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	2.8	< 0.5	4.9	< 0.5
Pyrene	0.5	mg/kg	5.7	< 0.5	10	0.7
Total PAH*	0.5	mg/kg	36.1	< 0.5	70.2	1.5
2-Fluorobiphenyl (surr.)	1	%	79	70	86	85
p-Terphenyl-d14 (surr.)	1	%	98	90	102	99

Client Sample ID			BH6-1.6-1.9	BH7-0.0-0.2	BH7-0.5-0.6	BH8-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20268	S21-Ja20269	S21-Ja20270	S21-Ja20271
Date Sampled			Jan 15, 2021	Jan 15, 2021	Jan 15, 2021	Jan 18, 2021
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	7.2	2.0	3.9	3.6
Cadmium	0.4	mg/kg	1.3	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	< 5	8.6	6.0
Copper	5	mg/kg	36	5.3	23	20
Lead	5	mg/kg	180	7.6	380	50
Mercury	0.1	mg/kg	0.9	< 0.1	0.3	< 0.1
Nickel	5	mg/kg	28	< 5	10	< 5
Zinc	5	mg/kg	730	28	220	140
% Moisture	1	%	25	9.2	10	18

Client Sample ID			BH8-0.5-0.6	BH9-0.4-0.6	BH9-0.7-0.8	BH10-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20272	S21-Ja20273	S21-Ja20274	S21-Ja20275
Date Sampled			Jan 18, 2021	Jan 18, 2021	Jan 18, 2021	Jan 18, 2021
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	31
TRH C15-C28	50	mg/kg	71	< 50	< 50	240
TRH C29-C36	50	mg/kg	59	< 50	< 50	160
TRH C10-C36 (Total)	50	mg/kg	130	< 50	< 50	431
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	%	55	65	64	75
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	63
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	63
TRH >C16-C34	100	mg/kg	120	< 100	< 100	330
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	120	< 100	< 100	393
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

Client Sample ID			BH8-0.5-0.6	BH9-0.4-0.6	BH9-0.7-0.8	BH10-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20272	S21-Ja20273	S21-Ja20274	S21-Ja20275
Date Sampled			Jan 18, 2021	Jan 18, 2021	Jan 18, 2021	Jan 18, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	1
2-Fluorobiphenyl (surr.)	1	%	69	71	65	75
p-Terphenyl-d14 (surr.)	1	%	86	98	89	104
Heavy Metals						
Arsenic	2	mg/kg	6.6	2.3	< 2	14
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.8	10	6.1	12
Copper	5	mg/kg	34	< 5	< 5	15
Lead	5	mg/kg	160	6.0	< 5	49
Mercury	0.1	mg/kg	0.2	< 0.1	< 0.1	0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	160	11	6.4	230
% Moisture	1	%	13	7.9	6.9	7.1

Client Sample ID			BH10-0.5-0.6	QC1	QC3	TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20276	S21-Ja20277	S21-Ja20278	S21-Ja20279
Date Sampled			Jan 18, 2021	Jan 18, 2021	Jan 18, 2021	Jan 18, 2021
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	-
TRH C15-C28	50	mg/kg	260	< 50	160	-
TRH C29-C36	50	mg/kg	120	< 50	150	-
TRH C10-C36 (Total)	50	mg/kg	380	< 50	310	-
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	%	68	68	62	62

Client Sample ID			BH10-0.5-0.6	QC1	QC3	TB
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S21-Ja20276	S21-Ja20277	S21-Ja20278	S21-Ja20279
Date Sampled			Jan 18, 2021	Jan 18, 2021	Jan 18, 2021	Jan 18, 2021
Test/Reference	LOR	Unit				
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	71	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	71	< 50	< 50	-
TRH >C16-C34	100	mg/kg	330	< 100	260	-
TRH >C34-C40	100	mg/kg	< 100	< 100	140	-
TRH >C10-C40 (total)*	100	mg/kg	401	< 100	400	-
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	< 0.5	< 0.5	0.7	-
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	0.7	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	1.4	-
2-Fluorobiphenyl (surr.)	1	%	71	71	75	-
p-Terphenyl-d14 (surr.)	1	%	90	94	95	-
Heavy Metals						
Arsenic	2	mg/kg	7.7	2.2	3.0	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	7.9	13	5.0	-
Copper	5	mg/kg	11	7.0	16	-
Lead	5	mg/kg	32	5.4	40	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Nickel	5	mg/kg	< 5	9.7	< 5	-
Zinc	5	mg/kg	85	25	110	-
% Moisture	1	%	6.4	10	15	-

Client Sample ID			TS
Sample Matrix			Soil
Eurofins Sample No.			S21-Ja20280
Date Sampled			Jan 18, 2021
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	91
BTEX			
Benzene	0.1	mg/kg	97
Toluene	0.1	mg/kg	95
Ethylbenzene	0.1	mg/kg	83
m&p-Xylenes	0.2	mg/kg	90
o-Xylene	0.1	mg/kg	71
Xylenes - Total*	0.3	mg/kg	84
4-Bromofluorobenzene (surr.)	1	%	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	89
TRH C6-C10	20	mg/kg	90
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	-

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.

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jan 22, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jan 22, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 22, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Jan 21, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jan 22, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jan 22, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jan 22, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jan 20, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 768512
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 20, 2021 11:22 AM
Due: Jan 28, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	HOLD	Moisture Set	Eurofins Suite B7	Eurofins Suite B1	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
1	BH1-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20254	X		X	X		
2	BH1-0.6-0.8	Jan 15, 2021		Soil	S21-Ja20255	X					
3	BH1-3.2-3.4	Jan 15, 2021		Soil	S21-Ja20256			X	X		
4	BH2-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20257			X	X		
5	BH2-2.8-3.0	Jan 15, 2021		Soil	S21-Ja20258			X	X		
6	BH3-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20259	X		X	X		
7	BH3-0.4-0.6	Jan 15, 2021		Soil	S21-Ja20260	X		X	X		
8	BH3-1.5-1.7	Jan 15, 2021		Soil	S21-Ja20261			X	X		
9	BH4-0.3-0.5	Jan 15, 2021		Soil	S21-Ja20262			X	X		

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
10	BH4-1.4-1.6	Jan 15, 2021		Soil	S21-Ja20263			X	X		
11	BH5-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20264	X					
12	BH5-0.3-0.5	Jan 15, 2021		Soil	S21-Ja20265	X		X	X		
13	BH5-1.0-1.2	Jan 15, 2021		Soil	S21-Ja20266			X	X		
14	BH6-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20267			X	X		
15	BH6-1.6-1.9	Jan 15, 2021		Soil	S21-Ja20268			X	X		
16	BH7-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20269			X	X	X	
17	BH7-0.5-0.6	Jan 15, 2021		Soil	S21-Ja20270			X	X	X	
18	BH8-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20271			X	X		
19	BH8-0.5-0.6	Jan 18, 2021		Soil	S21-Ja20272			X	X		
20	BH9-0.4-0.6	Jan 18, 2021		Soil	S21-Ja20273			X	X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
21	BH9-0.7-0.8	Jan 18, 2021		Soil	S21-Ja20274			X	X	X	
22	BH10-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20275			X	X		
23	BH10-0.5-0.6	Jan 18, 2021		Soil	S21-Ja20276			X	X		
24	QC1	Jan 18, 2021		Soil	S21-Ja20277			X	X		
25	QC3	Jan 18, 2021		Soil	S21-Ja20278			X	X		
26	TB	Jan 18, 2021		Soil	S21-Ja20279						X
27	TS	Jan 18, 2021		Soil	S21-Ja20280						X
28	LAB SPIKE	Jan 18, 2021		Soil	S21-Ja20281						X
29	BH2-0.8-1.0	Jan 15, 2021		Soil	S21-Ja20282		X				
30	BH4-0.0-0.2	Jan 15, 2021		Soil	S21-Ja20283		X				
31	BH6-0.4-0.6	Jan 15, 2021		Soil	S21-Ja20284		X				

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Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Mayfield Laboratory											
External Laboratory											
32	BH8-0.3-0.5	Jan 18, 2021		Soil	S21-Ja20285		X				
33	BH9-0.0-0.2	Jan 18, 2021		Soil	S21-Ja20286		X				
34	BH10-0.2-0.4	Jan 18, 2021		Soil	S21-Ja20287		X				
Test Counts						6	6	23	23	4	3

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 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	US Department of Defense Quality Systems Manual Version 5.3
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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- 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	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	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							

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 1999 NEPM Fractions									
TRH C6-C9			%	91			70-130	Pass	
TRH C10-C14			%	122			70-130	Pass	
LCS - % Recovery									
BTEX									
Benzene			%	84			70-130	Pass	
Toluene			%	94			70-130	Pass	
Ethylbenzene			%	91			70-130	Pass	
m&p-Xylenes			%	97			70-130	Pass	
o-Xylene			%	82			70-130	Pass	
Xylenes - Total*			%	92			70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
Naphthalene			%	100			70-130	Pass	
Naphthalene			%	110			70-130	Pass	
TRH C6-C10			%	92			70-130	Pass	
TRH C6-C10			%	82			70-130	Pass	
TRH >C10-C16			%	85			70-130	Pass	
LCS - % Recovery									
Polycyclic Aromatic Hydrocarbons									
Acenaphthene			%	79			70-130	Pass	
Acenaphthylene			%	81			70-130	Pass	
Anthracene			%	73			70-130	Pass	
Benz(a)anthracene			%	81			70-130	Pass	
Benzo(a)pyrene			%	75			70-130	Pass	
Benzo(b&j)fluoranthene			%	118			70-130	Pass	
Benzo(g,h,i)perylene			%	74			70-130	Pass	
Benzo(k)fluoranthene			%	81			70-130	Pass	
Chrysene			%	81			70-130	Pass	
Dibenz(a,h)anthracene			%	73			70-130	Pass	
Fluoranthene			%	77			70-130	Pass	
Fluorene			%	82			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	76			70-130	Pass	
Naphthalene			%	81			70-130	Pass	
Phenanthrene			%	84			70-130	Pass	
Pyrene			%	76			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	93			80-120	Pass	
Cadmium			%	95			80-120	Pass	
Chromium			%	97			80-120	Pass	
Copper			%	99			80-120	Pass	
Lead			%	101			80-120	Pass	
Mercury			%	110			80-120	Pass	
Nickel			%	99			80-120	Pass	
Zinc			%	92			80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Ja18046	NCP	%	76			70-130	Pass	
Acenaphthylene	S21-Ja26711	NCP	%	76			70-130	Pass	
Anthracene	S21-Ja18046	NCP	%	77			70-130	Pass	
Benz(a)anthracene	S21-Ja18046	NCP	%	71			70-130	Pass	
Benzo(a)pyrene	S21-Ja26711	NCP	%	76			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene	S21-Ja18046	NCP	%	74			70-130	Pass	
Benzo(g,h,i)perylene	S21-Ja21424	NCP	%	108			70-130	Pass	
Benzo(k)fluoranthene	S21-Ja26711	NCP	%	74			70-130	Pass	
Chrysene	S21-Ja18046	NCP	%	76			70-130	Pass	
Dibenz(a,h)anthracene	S21-Ja18046	NCP	%	74			70-130	Pass	
Fluoranthene	S21-Ja18046	NCP	%	79			70-130	Pass	
Fluorene	S21-Ja26711	NCP	%	71			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S21-Ja18046	NCP	%	74			70-130	Pass	
Naphthalene	S21-Ja18046	NCP	%	79			70-130	Pass	
Phenanthrene	S21-Ja18046	NCP	%	79			70-130	Pass	
Pyrene	S21-Ja18046	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Ja20261	CP	%	79			75-125	Pass	
Cadmium	S21-Ja20261	CP	%	88			75-125	Pass	
Chromium	S21-Ja20261	CP	%	75			75-125	Pass	
Copper	S21-Ja20261	CP	%	90			75-125	Pass	
Lead	S21-Ja20261	CP	%	92			75-125	Pass	
Mercury	S21-Ja20261	CP	%	97			75-125	Pass	
Nickel	S21-Ja20261	CP	%	93			75-125	Pass	
Zinc	S21-Ja20261	CP	%	88			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S21-Ja20265	CP	%	79			70-130	Pass	
TRH C10-C14	S21-Ja20265	CP	%	100			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Ja20265	CP	%	87			70-130	Pass	
Toluene	S21-Ja20265	CP	%	82			70-130	Pass	
Ethylbenzene	S21-Ja20265	CP	%	81			70-130	Pass	
m&p-Xylenes	S21-Ja20265	CP	%	91			70-130	Pass	
o-Xylene	S21-Ja20265	CP	%	100			70-130	Pass	
Xylenes - Total*	S21-Ja20265	CP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S21-Ja20265	CP	%	103			70-130	Pass	
TRH C6-C10	S21-Ja20265	CP	%	78			70-130	Pass	
TRH >C10-C16	S21-Ja20265	CP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S21-Ja20275	CP	%	82			70-130	Pass	
TRH C10-C14	S21-Ja20275	CP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S21-Ja20275	CP	%	72			70-130	Pass	
Toluene	S21-Ja20275	CP	%	84			70-130	Pass	
Ethylbenzene	S21-Ja20275	CP	%	88			70-130	Pass	
m&p-Xylenes	S21-Ja20275	CP	%	94			70-130	Pass	
o-Xylene	S21-Ja20275	CP	%	84			70-130	Pass	
Xylenes - Total*	S21-Ja20275	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S21-Ja20275	CP	%	107			70-130	Pass	
TRH C6-C10	S21-Ja20275	CP	%	81			70-130	Pass	
TRH >C10-C16	S21-Ja20275	CP	%	88			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Ja20258	CP	%	16	15	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S21-Ja20260	CP	mg/kg	< 2	2.0	13	30%	Pass	
Cadmium	S21-Ja20260	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S21-Ja20260	CP	mg/kg	7.4	10.0	30	30%	Pass	
Copper	S21-Ja20260	CP	mg/kg	< 5	6.2	32	30%	Fail	Q15
Lead	S21-Ja20260	CP	mg/kg	5.5	5.8	6.0	30%	Pass	
Mercury	S21-Ja20260	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S21-Ja20260	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S21-Ja20260	CP	mg/kg	7.7	7.0	9.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S21-Ja20263	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Ja20263	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Ja20263	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S21-Ja20263	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Ja20263	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Ja20263	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Ja20263	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Ja20263	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Ja20263	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Ja20263	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S21-Ja20263	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S21-Ja20263	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S21-Ja20263	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S21-Ja20263	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S21-Ja20263	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S21-Ja20269	CP	%	9.2	12	23	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S21-Ja20271	CP	mg/kg	3.6	4.2	16	30%	Pass
Cadmium	S21-Ja20271	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S21-Ja20271	CP	mg/kg	6.0	7.2	18	30%	Pass
Copper	S21-Ja20271	CP	mg/kg	20	22	8.0	30%	Pass
Lead	S21-Ja20271	CP	mg/kg	50	53	5.0	30%	Pass
Mercury	S21-Ja20271	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S21-Ja20271	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S21-Ja20271	CP	mg/kg	140	150	6.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S21-Ja20274	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	S21-Ja20274	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S21-Ja20274	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S21-Ja20274	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S21-Ja20274	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S21-Ja20274	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S21-Ja20274	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S21-Ja20274	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S21-Ja20274	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total*	S21-Ja20274	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S21-Ja20274	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S21-Ja20274	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S21-Ja20274	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S21-Ja20274	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S21-Ja20274	CP	mg/kg	< 100	< 100	<1	30%	Pass

Comments

Sample Integrity

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

Qualifier Codes/Comments

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



Glenn Jackson

General 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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#AU04_Enviro_Sample_NSW

From: Andrew Black
Sent: Friday, 29 January 2021 9:33 AM
To: #AU04_Enviro_Sample_NSW; #AU04_COCNSW
Subject: 5 DAY TAT ADDITIONAL ANALYSIS: FW: Eurofins Test Results - Report 768512 : Site NEWCASTLE GRAMMAR - PSI (754-NTLGE282700)

Follow Up Flag: Follow up
Flag Status: Flagged

5 day TAT additional analysis thanks team

Andrew Black
Phone: +61 410 220 750
Email: AndrewBlack@eurofins.com

From: Schrader, Craig <Craig.Schrader@coffey.com>
Sent: Friday, 29 January 2021 9:31 AM
To: Andrew Black <AndrewBlack@eurofins.com>
Cc: Blackford, Sean <Sean.Blackford@coffey.com>
Subject: RE: Eurofins Test Results - Report 768512 : Site NEWCASTLE GRAMMAR - PSI (754-NTLGE282700)

EXTERNAL EMAIL*

Hi Andrew,

Can I please get sample BH5-0.3-0.5 analysed for suite R21 – NEPM Screen for soil classification on a standard TAT.

Thank you

Regards

Craig Schrader
Associate Environmental Scientist

16 Callistemon Close,
Warabrook
NSW 2304

t: +61 2 4028 9700
m: +61 428 104 881
w: coffey.com



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>>> Ingenuity@coffey – it's the ideas that count

From: AndrewBlack@eurofins.com <AndrewBlack@eurofins.com>
Sent: Thursday, 28 January 2021 3:39 PM

To: Schrader, Craig <Craig.Schrader@coffey.com>

Cc: COF.newcastle <newcastle@coffey.com>

Subject: Eurofins Test Results - Report 768512 : Site NEWCASTLE GRAMMAR - PSI (754-NTLGE282700)

 **CAUTION:** This email originated from an external sender. Verify the source before opening links or attachments.



Regards

Andrew Black

Analytical Services Manager

Eurofins | Environment Testing

Unit 7

7 Friesian Close

SANDGATE NSW 2304

AUSTRALIA

Phone: +61 299 008 490

Mobile: +61 410 220 750

Email: AndrewBlack@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1108 - Emissions from Stationary Sources](#)

[EnviroNote 1103 - NATA Accreditation for Dioxins](#)

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NATA # 1261
Site # 1254 & 14271

Sydney

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Phone : +61 2 9900 8400
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Brisbane

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NATA # 1261 Site # 20794

Perth

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Phone : +61 8 9251 9600
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Site # 23736

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PO Box 60 Wickham 2293
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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: Coffey Environments P/L N'castle
Contact name: Craig Schrader
Project name: ADDITIONAL - NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700
Turnaround time: 5 Day
Date/Time received: Jan 29, 2021 9:31 AM
Eurofins reference: 770320

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 17.2 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- ✓ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Craig Schrader - craig.schrader@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments P/L N'castle email address.

Australia

Melbourne

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Site # 23736

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IANZ # 1327

Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: ADDITIONAL - NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 770320
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 29, 2021 9:31 AM
Due: Feb 5, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Moisture Set	NEPM Screen for Soil Classification
Melbourne Laboratory - NATA Site # 1254 & 14271							X
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							X
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH5-0.3-0.5	Jan 15, 2021		Soil	S21-Ja35046	X	X
Test Counts						1	1

Coffey Environments Pty Ltd Newcastle
16 Callistemon Close
Warabrook
NSW 2304



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Craig Schrader**

Report **770320-S**
Project name **ADDITIONAL - NEWCASTLE GRAMMAR - PSI**
Project ID **754-NTLGE282700**
Received Date **Jan 29, 2021**

Client Sample ID			BH5-0.3-0.5
Sample Matrix			Soil
Eurofins Sample No.			S21-Ja35046
Date Sampled			Jan 15, 2021
Test/Reference	LOR	Unit	
% Clay	1	%	17
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	21
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	5.6
Total Organic Carbon	0.1	%	1.2
% Moisture	1	%	14
Heavy Metals			
Iron	20	mg/kg	14000
Heavy Metals			
Iron (%)	0.01	%	1.4
Cation Exchange Capacity			
Cation Exchange Capacity	0.05	meq/100g	5.7

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.

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
NEPM Screen for Soil Classification			
% Clay	Brisbane	Feb 05, 2021	14 Days
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Sydney	Feb 01, 2021	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Sydney	Feb 01, 2021	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Feb 05, 2021	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Sydney	Feb 01, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Cation Exchange Capacity	Melbourne	Feb 08, 2021	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Sydney	Jan 29, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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IANZ # 1290

ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: ADDITIONAL - NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 770320
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Jan 29, 2021 9:31 AM
Due: Feb 5, 2021
Priority: 5 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Moisture Set	NEPM Screen for Soil Classification
Melbourne Laboratory - NATA Site # 1254 & 14271							X
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							X
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH5-0.3-0.5	Jan 15, 2021		Soil	S21-Ja35046	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 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	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NC	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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- 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										
Conductivity (1:5 aqueous extract at 25°C as rec.)				uS/cm	< 10			10	Pass	
Total Organic Carbon				%	< 0.1			0.1	Pass	
Method Blank										
Heavy Metals										
Iron				mg/kg	< 20			20	Pass	
Method Blank										
Heavy Metals										
Iron (%)				%	< 0.01			0.01	Pass	
Method Blank										
Cation Exchange Capacity										
Cation Exchange Capacity				meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery										
Conductivity (1:5 aqueous extract at 25°C as rec.)				%	88			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Iron				%	108			80-120	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.)	S21-Ja33238	NCP	uS/cm	180	180	2.0		30%	Pass	
Total Organic Carbon	M21-Fe10313	NCP	%	4.4	3.4	25		30%	Pass	
% Moisture	M21-Ja34904	NCP	%	28	27	5.0		30%	Pass	
Duplicate										
Heavy Metals				Result 1	Result 2	RPD				
Iron	S21-Fe00030	NCP	mg/kg	20000	22000	9.0		30%	Pass	

Comments**Sample Integrity**

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

Authorised by:

Andrew Black	Analytical Services Manager
Charl Du Preez	Senior Analyst-Inorganic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
John Nguyen	Senior Analyst-Metal (NSW)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Scott Beddoes	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

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

#AU04_Enviro_Sample_NSW

Subject: FW: 1 DAY TAT ADDITIONAL ANALYSIS: FW: Additional Analysis Request (768512-S)
Importance: High

From: Blackford, Sean <Sean.Blackford@coffey.com>
Sent: Tuesday, 23 February 2021 1:04 PM
To: Andrew Black <AndrewBlack@eurofins.com>
Subject: Additional Analysis Request (768512-S)

EXTERNAL EMAIL*

Hey Andrew,

Can I please request additional analysis from recent soil report (768512-S).
Can I request sample **BH4-0.0-0.2** currently on HOLD, be analysed for **suite B7** please? Can I request the fastest TAT the lab can provide?

Kind Regards,

Sean Blackford
Senior Environmental Consultant

16 Callistemon Close
Warabrook NSW, 2304

t: +61 2 4028 9700
m: +418 549 796



Click [here](#) to report this email as spam.

ScannedByWebsenseForEurofins

* WARNING - EXTERNAL: This email originated from outside of Eurofins. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!

Australia
Melbourne

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Site # 23736

Newcastle

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Phone : +64 9 526 45 51
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Christchurch

43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name: Coffey Environments P/L N'castle
Contact name: Craig Schrader
Project name: ADDITIONAL NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700
Turnaround time: 1 Day
Date/Time received: Feb 23, 2021 1:04 PM
Eurofins reference: 775710

Sample Information

- ✓ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ✓ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 17.2 degrees Celsius.
- ✓ All samples have been received as described on the above COC.
- ✓ COC has been completed correctly.
- ✓ Attempt to chill was evident.
- ✓ Appropriately preserved sample containers have been used.
- ✓ All samples were received in good condition.
- NB** Necessary sampling information not provided, the Laboratory will not be responsible for compromised results should testing be performed outside recommended holding times.
- ✓ Appropriate sample containers have been used.
- ✓ Sample containers for volatile analysis received with zero headspace.
- ✗ Split sample sent to requested external lab.
- ✗ Some samples have been subcontracted.
- N/A** Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: AndrewBlack@eurofins.com

Results will be delivered electronically via email to Craig Schrader - craig.schrader@coffey.com.

Note: A copy of these results will also be delivered to the general Coffey Environments P/L N'castle email address.

Australia

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ABN: 50 005 085 521 web: www.eurofins.com.au email: EnviroSales@eurofins.com

Company Name: Coffey Environments P/L N'castle
Address: 16 Callistemon Close
Warabrook
NSW 2304

Project Name: ADDITIONAL NEWCASTLE GRAMMAR - PSI
Project ID: 754-NTLGE282700

Order No.:
Report #: 775710
Phone: 02 4016 2300
Fax: 02 4016 2380

Received: Feb 23, 2021 1:04 PM
Due: Feb 24, 2021
Priority: 1 Day
Contact Name: Craig Schrader

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Moisture Set	Eurofins Suite B7
						X	X
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
Mayfield Laboratory							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH4-0.0-0.2	Jan 15, 2021		Soil	S21-Fe43808	X	X
Test Counts						1	1

Coffey Environments Pty Ltd Newcastle
16 Callistemon Close
Warabrook
NSW 2304



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Craig Schrader**

Report **775710-S**
Project name **ADDITIONAL NEWCASTLE GRAMMAR - PSI**
Project ID **754-NTLGE282700**
Received Date **Feb 23, 2021**

Client Sample ID			BH4-0.0-0.2
Sample Matrix			Soil
Eurofins Sample No.			S21-Fe43808
Date Sampled			Jan 15, 2021
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	160
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	160
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	%	95
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	180
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	180
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	11
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	11
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	11
Acenaphthene	0.5	mg/kg	1.4
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	3.7
Benz(a)anthracene	0.5	mg/kg	7.1
Benzo(a)pyrene	0.5	mg/kg	7.1
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	13
Benzo(g,h,i)perylene	0.5	mg/kg	4.3
Benzo(k)fluoranthene	0.5	mg/kg	7.9
Chrysene	0.5	mg/kg	5.0

Client Sample ID			BH4-0.0-0.2
Sample Matrix			Soil
Eurofins Sample No.			S21-Fe43808
Date Sampled			Jan 15, 2021
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Dibenz(a,h)anthracene	0.5	mg/kg	0.7
Fluoranthene	0.5	mg/kg	32
Fluorene	0.5	mg/kg	2.0
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	3.4
Naphthalene	0.5	mg/kg	1.5
Phenanthrene	0.5	mg/kg	31
Pyrene	0.5	mg/kg	28
Total PAH*	0.5	mg/kg	148.1
2-Fluorobiphenyl (surr.)	1	%	81
p-Terphenyl-d14 (surr.)	1	%	86
Heavy Metals			
Arsenic	2	mg/kg	3.9
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	8.9
Copper	5	mg/kg	8.7
Lead	5	mg/kg	16
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	9.3
Zinc	5	mg/kg	39
% Moisture	1	%	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.

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Feb 23, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Feb 23, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 23, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Feb 23, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Feb 23, 2021	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Feb 23, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Feb 23, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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NSW 2304

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Project ID: 754-NTLGE282700

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Phone: 02 4016 2300
Fax: 02 4016 2380

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Eurofins Analytical Services Manager : Andrew Black

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1	BH4-0.0-0.2	Jan 15, 2021		Soil	S21-Fe43808	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid 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. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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

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PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

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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	%	90			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14				%	83			70-130	Pass	
LCS - % Recovery										
BTEX										
Benzene				%	100			70-130	Pass	
Toluene				%	98			70-130	Pass	
Ethylbenzene				%	106			70-130	Pass	
m&p-Xylenes				%	109			70-130	Pass	
o-Xylene				%	108			70-130	Pass	
Xylenes - Total*				%	109			70-130	Pass	
LCS - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions										
Naphthalene				%	125			70-130	Pass	
TRH C6-C10				%	90			70-130	Pass	
TRH >C10-C16				%	81			70-130	Pass	
LCS - % Recovery										
Polycyclic Aromatic Hydrocarbons										
Acenaphthene				%	90			70-130	Pass	
Acenaphthylene				%	89			70-130	Pass	
Anthracene				%	87			70-130	Pass	
Benz(a)anthracene				%	90			70-130	Pass	
Benzo(a)pyrene				%	86			70-130	Pass	
Benzo(b&j)fluoranthene				%	101			70-130	Pass	
Benzo(g,h,i)perylene				%	89			70-130	Pass	
Benzo(k)fluoranthene				%	89			70-130	Pass	
Chrysene				%	82			70-130	Pass	
Dibenz(a,h)anthracene				%	83			70-130	Pass	
Fluoranthene				%	94			70-130	Pass	
Fluorene				%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene				%	88			70-130	Pass	
Naphthalene				%	91			70-130	Pass	
Phenanthrene				%	88			70-130	Pass	
Pyrene				%	94			70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic				%	99			80-120	Pass	
Cadmium				%	94			80-120	Pass	
Chromium				%	91			80-120	Pass	
Copper				%	93			80-120	Pass	
Lead				%	101			80-120	Pass	
Mercury				%	98			80-120	Pass	
Nickel				%	93			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		S21-Fe39018	NCP	%	72			70-130	Pass	
TRH C10-C14		S21-Fe44541	NCP	%	128			70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene		S21-Fe39018	NCP	%	73			70-130	Pass	
Toluene		S21-Fe39018	NCP	%	74			70-130	Pass	
Ethylbenzene		S21-Fe39018	NCP	%	79			70-130	Pass	
m&p-Xylenes		S21-Fe39018	NCP	%	82			70-130	Pass	
o-Xylene		S21-Fe39018	NCP	%	81			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	S21-Fe39018	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S21-Fe39018	NCP	%	82			70-130	Pass	
TRH C6-C10	S21-Fe39018	NCP	%	73			70-130	Pass	
TRH >C10-C16	S21-Fe44541	NCP	%	128			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S21-Fe34082	NCP	%	83			70-130	Pass	
Acenaphthylene	S21-Fe34082	NCP	%	82			70-130	Pass	
Anthracene	S21-Fe34082	NCP	%	79			70-130	Pass	
Benz(a)anthracene	S21-Fe34082	NCP	%	93			70-130	Pass	
Benzo(a)pyrene	S21-Fe34082	NCP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	S21-Fe34082	NCP	%	100			70-130	Pass	
Benzo(g,h,i)perylene	S21-Fe34082	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	S21-Fe34082	NCP	%	75			70-130	Pass	
Chrysene	S21-Fe34082	NCP	%	73			70-130	Pass	
Dibenz(a,h)anthracene	S21-Fe34082	NCP	%	91			70-130	Pass	
Fluoranthene	S21-Fe34082	NCP	%	83			70-130	Pass	
Fluorene	S21-Fe34082	NCP	%	76			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S21-Fe34082	NCP	%	92			70-130	Pass	
Naphthalene	S21-Fe34082	NCP	%	79			70-130	Pass	
Phenanthrene	S21-Fe34082	NCP	%	77			70-130	Pass	
Pyrene	S21-Fe34082	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S21-Fe33997	NCP	%	111			75-125	Pass	
Cadmium	S21-Fe33997	NCP	%	108			75-125	Pass	
Chromium	S21-Fe33997	NCP	%	98			75-125	Pass	
Copper	S21-Fe34505	NCP	%	97			75-125	Pass	
Lead	S21-Fe33997	NCP	%	115			75-125	Pass	
Mercury	S21-Fe33997	NCP	%	101			75-125	Pass	
Nickel	S21-Fe33997	NCP	%	103			75-125	Pass	
Zinc	S21-Fe33997	NCP	%	107			75-125	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	S21-Fe43808	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S21-Fe43823	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S21-Fe43823	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S21-Fe43823	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S21-Fe43808	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S21-Fe43808	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S21-Fe43808	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S21-Fe43808	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S21-Fe43808	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S21-Fe43808	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S21-Fe43808	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S21-Fe43808	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S21-Fe43823	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S21-Fe43823	NCP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S21-Fe43823	NCP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S21-Fe44546	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S21-Fe33996	NCP	mg/kg	2.0	2.4	18	30%	Pass
Cadmium	S21-Fe33996	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S21-Fe33996	NCP	mg/kg	< 5	6.3	32	30%	Fail Q15
Copper	S21-Fe33996	NCP	mg/kg	12	17	35	30%	Fail Q15
Lead	S21-Fe33996	NCP	mg/kg	170	200	15	30%	Pass
Mercury	S21-Fe33996	NCP	mg/kg	0.2	0.1	41	30%	Fail Q15
Nickel	S21-Fe33996	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S21-Fe33996	NCP	mg/kg	130	130	1.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S21-Fe43449	NCP	%	2.3	2.2	7.0	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	No
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 Environment Testing'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
Andrew Sullivan	Senior Analyst-Organic (NSW)
John Nguyen	Senior Analyst-Metal (NSW)



Glenn Jackson
General 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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CERTIFICATE OF ANALYSIS

Work Order : **ES2101882**
Client : **COFFEY ENVIRONMENTS PTY LTD**
Contact : MR CRAIG SCHRADER
Address : 19 WARABROOK BOULEVARD
 WARABROOK NSW, AUSTRALIA 2304
Telephone : +61 02 4016 2300
Project : 754-NTLGE282700 NEWCASTLE GRAMMAR - PSI
Order number : ----
C-O-C number : ----
Sampler : SEAN BLACKFORD
Site :
Quote number : EN/222
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Grace White
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 20-Jan-2021 12:15
Date Analysis Commenced : 22-Jan-2021
Issue Date : 28-Jan-2021 13:02



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, unless the sampling was conducted by ALS. 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC2	QC4	----	----	----
Sampling date / time					18-Jan-2021 00:00	18-Jan-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2101882-001	ES2101882-002	-----	-----	-----
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		9.2	14.4	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		8	4	----	----	----
Copper	7440-50-8	5	mg/kg		5	15	----	----	----
Lead	7439-92-1	5	mg/kg		<5	37	----	----	----
Nickel	7440-02-0	2	mg/kg		9	2	----	----	----
Zinc	7440-66-6	5	mg/kg		19	106	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	1.0	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	1.8	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	1.8	----	----	----
Benzo(a)anthracene	56-55-3	0.5	mg/kg		<0.5	0.6	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	0.7	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	0.8	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	0.6	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	7.3	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	0.7	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	1.0	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.4	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC2	QC4	----	----	----
Sampling date / time					18-Jan-2021 00:00	18-Jan-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2101882-001	ES2101882-002	-----	-----	-----
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		90.7	96.4	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		86.2	89.5	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		84.4	84.2	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		98.0	93.9	----	----	----
Anthracene-d10	1719-06-8	0.5	%		105	108	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		94.4	93.4	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		87.3	89.2	----	----	----
Toluene-D8	2037-26-5	0.2	%		85.3	88.4	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC2	QC4	----	----	----
Sampling date / time					18-Jan-2021 00:00	18-Jan-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2101882-001	ES2101882-002	-----	-----	-----
					Result	Result	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		89.6	90.5	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

QUALITY CONTROL REPORT

Work Order : **ES2101882**

Page : 1 of 7

Client : **COFFEY ENVIRONMENTS PTY LTD**

Contact : **MR CRAIG SCHRADER**

Address : **19 WARABROOK BOULEVARD
WARABROOK NSW, AUSTRALIA 2304**

Telephone : **+61 02 4016 2300**

Project : **754-NTLGE282700 NEWCASTLE GRAMMAR - PSI**

Order number : ----

C-O-C number : ----

Sampler : **SEAN BLACKFORD**

Site :

Quote number : **EN/222**

No. of samples received : **2**

No. of samples analysed : **2**

Laboratory : **Environmental Division Sydney**

Contact : **Grace White**

Address : **277-289 Woodpark Road Smithfield NSW Australia 2164**

Telephone : **+61 2 8784 8555**

Date Samples Received : **20-Jan-2021**

Date Analysis Commenced : **22-Jan-2021**

Issue Date : **28-Jan-2021**



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, unless the sampling was conducted by ALS. 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
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 3474608)									
ES2101743-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	11	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	5	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	9	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	15	14	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	60	58	3.60	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	43	42	3.47	No Limit
ES2101743-026	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	16	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	16	11	30.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	27	10.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	78	94	17.7	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	31	35	13.0	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3474613)									
ES2101743-009	Anonymous	EA055: Moisture Content	----	0.1	%	20.7	20.2	2.79	0% - 20%
ES2101743-031	Anonymous	EA055: Moisture Content	----	0.1	%	19.0	16.6	13.5	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3474609)									
ES2101743-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES2101743-026	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: 3474825)									
ES2101875-001	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	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3474825) - continued									
ES2101875-001	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	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3474826)									
ES2101875-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3475697)									
ES2101858-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES2101950-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3474826)									
ES2101875-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3475697)									
ES2101858-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES2101950-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 3475697)									
ES2101858-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		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

Page : 4 of 7
 Work Order : ES2101882
 Client : COFFEY ENVIRONMENTS PTY LTD
 Project : 754-NTLGE282700 NEWCASTLE GRAMMAR - PSI



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 3475697) - continued									
ES2101950-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		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

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.

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)		
			Low	High	
	<5	121.1 mg/kg	99.9	88.0	113
	<1	0.74 mg/kg	79.9	70.0	130
	<2	20.2 mg/kg	96.1	68.0	132
	<5	52.9 mg/kg	103	89.0	111
	<5	62.1 mg/kg	97.9	82.0	119
	<2	15.4 mg/kg	96.6	80.0	120
	<5	162 mg/kg	79.7	66.0	133
	<0.1	0.073 mg/kg	83.7	70.0	130
	<0.5	6 mg/kg	93.2	77.0	125
	<0.5	6 mg/kg	101	72.0	124
	<0.5	6 mg/kg	103	73.0	127
	<0.5	6 mg/kg	100	72.0	126
	<0.5	6 mg/kg	101	75.0	127
	<0.5	6 mg/kg	98.4	77.0	127
	<0.5	6 mg/kg	94.5	73.0	127
	<0.5	6 mg/kg	95.5	74.0	128
	<0.5	6 mg/kg	92.2	69.0	123
	<0.5	6 mg/kg	97.7	75.0	127
	<0.5	6 mg/kg	88.7	68.0	116
	<0.5	6 mg/kg	99.9	74.0	126
	<0.5	6 mg/kg	99.9	70.0	126
	<0.5	6 mg/kg	88.4	61.0	121
	<0.5	6 mg/kg	85.4	62.0	118
	<0.5	6 mg/kg	84.6	63.0	121
	<50	300 mg/kg	92.4	75.0	129
	<100	450 mg/kg	87.2	77.0	131
	<100	300 mg/kg	86.9	71.0	129
	<10	26 mg/kg	98.3	68.4	128



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3474826) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	92.3	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	85.6	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	87.3	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3475697)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	100	68.4	128
EP080: BTEXN (QCLot: 3475697)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	91.0	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	88.6	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	87.6	65.0	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	85.9	66.0	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	87.7	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	86.5	63.0	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 3474608)							
ES2101743-006	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.4	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.6	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	83.9	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	95.1	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	90.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	88.5	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	90.2	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3474609)							
ES2101743-006	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	78.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3474825)							
ES2101875-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3474826)							
ES2101875-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	94.0	73.0	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	94.1	53.0	131



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3474826) - continued							
ES2101875-001	Anonymous	EP071: C29 - C36 Fraction	----	1714 mg/kg	123	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3475697)							
ES2101858-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	101	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3474826)							
ES2101875-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	84.5	73.0	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	112	53.0	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	120	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3475697)							
ES2101858-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	102	70.0	130
EP080: BTEXN (QCLot: 3475697)							
ES2101858-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	88.3	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	86.8	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	87.7	70.0	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	85.4	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.2	70.0	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	84.9	70.0	130	

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2101882	Page	: 1 of 4
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR CRAIG SCHRADER	Telephone	: +61 2 8784 8555
Project	: 754-NTLGE282700 NEWCASTLE GRAMMAR - PSI	Date Samples Received	: 20-Jan-2021
Site	:	Issue Date	: 28-Jan-2021
Sampler	: SEAN BLACKFORD	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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.
- **NO** Matrix Spike outliers occur.
- 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.



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; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA055: Moisture Content (Dried @ 105-110°C)								
Soil Glass Jar - Unpreserved (EA055) QC2,	QC4	18-Jan-2021	----	----	----	22-Jan-2021	01-Feb-2021	✓
EG005(ED093)T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) QC2,	QC4	18-Jan-2021	22-Jan-2021	17-Jul-2021	✓	25-Jan-2021	17-Jul-2021	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) QC2,	QC4	18-Jan-2021	22-Jan-2021	15-Feb-2021	✓	25-Jan-2021	15-Feb-2021	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM)) QC2,	QC4	18-Jan-2021	22-Jan-2021	01-Feb-2021	✓	25-Jan-2021	03-Mar-2021	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP080) QC2,	QC4	18-Jan-2021	22-Jan-2021	01-Feb-2021	✓	22-Jan-2021	01-Feb-2021	✓
Soil Glass Jar - Unpreserved (EP071) QC2,	QC4	18-Jan-2021	22-Jan-2021	01-Feb-2021	✓	27-Jan-2021	03-Mar-2021	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP080) QC2,	QC4	18-Jan-2021	22-Jan-2021	01-Feb-2021	✓	22-Jan-2021	01-Feb-2021	✓
Soil Glass Jar - Unpreserved (EP071) QC2,	QC4	18-Jan-2021	22-Jan-2021	01-Feb-2021	✓	27-Jan-2021	03-Mar-2021	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) QC2,	QC4	18-Jan-2021	22-Jan-2021	01-Feb-2021	✓	22-Jan-2021	01-Feb-2021	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	5.56	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 Schedule B(3).
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 Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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 Schedule B(3).
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, Na ₂ SO ₄ 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.

Reference No. _____

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 2



NITRA TECH COMPANY

Consigning Office: Warabrook

Report Results to: Craig Schrader

Mobile:

0428 104 881

Email:

Craig.schrader@coffey.com

Invoices to: Newcastle Accounts

Phone:

02 4028 9700

Email:

newcastle@coffey.com

Project No: 754-NTLGE282700

Task No:

Lab

Project Name: Newcastle Grammar - PSI

Laboratory: Eurofins

Sample's Name: S. Blackford

Project Manager: Paul Wright/Craig Schrader

Special Instructions:

Std TAT

Analysis Request Section

NOTES

Please change the job number to 754-NTLGE282700 rather than the one written on each jar please.
NTLEN234634 is incorrect

Lab No.	Sample ID	Sample Date	Time	Matrix (soil, etc)	Container Type & Preservative*	T-A-T (specify)	Suite B7	Suite B1	Asbestos P/A	HOLD	Notes
	BH1-0-0-0.2	15/1/2021		Soil	J,ZL	Std	X		X		
	BH1-0-6-0.8								X		
	BH1-3-2-3.4						X				
	BH2-0-0-0.2						X				
	BH2-0-8-1.0										
	BH2-2-8-3.0						X				
	BH3-0-0-0.2						X		X		
	BH3-0-4-0.6						X		X		
	BH3-1-5-1.7						X				
	BH4-0-0-0.2										
	BH4-						X				
	BH4-						X				
	BH5-0-0-0.2								X		
	BH5-0-3-0.5						X		X		
	BH5-1-0-1.2						X				
	BH6-0-0-0.2						X				
	BH6-0-4-0.6										
	BH6-1-6-1.9						X				

Telephone : + 61-2-8784 8555



Environmental Division
Sydney
Work Order Reference
ES2101882

Please confirm BH4 - sample depths for two jars & analyse both suite B7

REINQUISHED BY

Name: S. Blackford Date: 20.01.21

Coffey Environments

Time:

RECEIVED BY

Name: C. Eudine

Date: 20/01/21

Company: Eurofins

Time: 11:22am

Name:

Date:

Company:

Time:

Name: Sep M.

Date: 20/01/21

Company: HUS CREUS NEST

Time: 12:15pm

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition

All Documentation is in Proper Order

Samples Received Properly Chilled

Lab. Ref/Barc No.

768512

Rec: 50g Styro 20/1/21 1500

coffee		Consigning Office: Warabrook		Report Results to: Craig Schrader		Mobile: 0428 104 881		Email: Craig.schrader@coffee.com				
Project Name: Newcastle Grammar - PSI		Task No: 754-NTLGE282700		Invoices to: Newcastle Accounts		Phone: 02 4028 9700		Email: newcastle@coffee.com				
Sampler's Name: S. Blackford		Laboratory: Eurofins		Project Manager: Paul Wright/Craig Schrader		Analysis Request Section						
Special Instructions: Sld TAT												
Lab No.	Sample ID	Sample Date	Time	Matrix (Soil, etc)	Container Type & Preservative*	T-A-T (specify)	Suite B7	Suite B1	Asbestos P/A	HOLD	Analysis Request Section	Notes
	BH7-0.0-0.2	15/1/2021		Soil	1,ZL	Std	X	X				Please change the job number to 754-NTLGE282700 rather than the one written on each jar please. NTLN234634 is incorrect
	BH7-0.5-0.6						X	X				
	BH8-0.0-0.2	18/01/2021		Soil	1,ZL	Std	X					
	BH8-0.3-0.5											
	BH8-0.5-0.6						X					
	BH9-0.0-0.2											
	BH9-0.4-0.6						X	X				
	BH9-0.7-0.8						X	X				
	BH10-0.0-0.2						X					
	BH10-0.2-0.4						X					
	BH10-0.5-0.6						X					
	QC1						X					
①	QC2						X					SEND QC2 to ALS
	QC3						X					
②	QC4						X					SEND QC4 to ALS
	TB			Soil	Vx2		X					
	TS				Vx2				X			
RELINQUISHED BY						RECEIVED BY						
Name: S. Blackford Date: 20.01.21						Name: S. Blackford Date: 20/01/21						
Coffey Environments Time:						Company: ALS Time: 12:15pm						
Name:						Name:						
Company:						Company:						
*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative												

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☒

All Documentation is in Proper Order ☒

Samples Received Properly Chilled ☒

Lab. Ref/Barc No.

Rec. Sofm 20/11/21 15:00

CERTIFICATE OF ANALYSIS

Work Order : **ES2102972**
Client : **COFFEY ENVIRONMENTS PTY LTD**
Contact : MR SIMON BAKER
Address : 16 CALLISTEMON CLOSE
 WARABROOK NEWCASTLE 2304
Telephone : ----
Project : 754-NTLGE282700 NEWCASTLE GRAMMAR
Order number : ----
C-O-C number : ----
Sampler : HAROLD LEE/SAM RAMSEY
Site :
Quote number : EN/222
No. of samples received : 23
No. of samples analysed : 18

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Grace White
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61 2 8784 8555
Date Samples Received : 29-Jan-2021 14:30
Date Analysis Commenced : 02-Feb-2021
Issue Date : 09-Feb-2021 17:56



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, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	GBH02 2.5m	GBH02 4.0m	GBH02 8.5m	GBH02 10.0m	GBH02 11.5m
Sampling date / time					21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102972-001	ES2102972-002	ES2102972-003	ES2102972-004	ES2102972-005
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit	----	7.0	8.6	----	7.6	
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm	----	98	203	----	33	
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit	7.0	7.3	8.7	8.1	7.8	
ø pH (Fox)	----	0.1	pH Unit	2.8	3.3	2.0	1.3	2.1	
ø Reaction Rate	----	1	-	3	3	4	4	3	
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	----	29.6	36.1	----	18.1	
EA080: Resistivity									
Resistivity at 25°C	----	1	ohm cm	----	10200	4930	----	30300	
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg	----	70	210	----	60	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg	----	80	170	----	40	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	GHB02 14.5m	GHB02 16.0m	GHB02 17.5m	GHB02 19.0m	GBH03 3.0m
Sampling date / time					21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102972-006	ES2102972-007	ES2102972-008	ES2102972-009	ES2102972-010
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		----	8.4	----	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		----	224	----	----	----
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit		7.6	8.7	8.6	8.5	6.3
ø pH (Fox)	----	0.1	pH Unit		2.1	1.6	1.5	2.0	3.6
ø Reaction Rate	----	1	-		3	4	4	4	3
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		----	41.1	----	----	----
EA080: Resistivity									
Resistivity at 25°C	----	1	ohm cm		----	4460	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		----	500	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		----	180	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	GBH03 4.5m	GBH03 7.5m	GBH03 10.5m	GBH03 12.0m	GBH03 15.0m
Sampling date / time					21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102972-011	ES2102972-012	ES2102972-013	ES2102972-014	ES2102972-015
				Result	Result	Result	Result	Result	Result
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		6.4	9.0	----	7.8	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		301	187	----	132	----
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit		7.0	8.8	8.1	8.0	7.7
ø pH (Fox)	----	0.1	pH Unit		1.9	2.7	1.3	5.1	1.8
ø Reaction Rate	----	1	-		4	3	4	4	4
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		39.6	21.5	----	37.7	----
EA080: Resistivity									
Resistivity at 25°C	----	1	ohm cm		3320	5350	----	7580	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		90	60	----	10	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		610	190	----	90	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	GBH03 16.5m	GBH03 18.0m	GBH03 19.5m	----	----
Sampling date / time					21-Jan-2021 00:00	21-Jan-2021 00:00	21-Jan-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2102972-016	ES2102972-017	ES2102972-018	-----	-----
				Result	Result	Result	Result	----	----
EA002: pH 1:5 (Soils)									
pH Value	----	0.1	pH Unit		7.2	----	----	----	----
EA010: Conductivity (1:5)									
Electrical Conductivity @ 25°C	----	1	µS/cm		110	----	----	----	----
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit		7.0	7.1	7.9	----	----
ø pH (Fox)	----	0.1	pH Unit		2.4	2.0	6.8	----	----
ø Reaction Rate	----	1	-		4	3	4	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		18.3	----	----	----	----
EA080: Resistivity									
Resistivity at 25°C	----	1	ohm cm		9090	----	----	----	----
ED040S : Soluble Sulfate by ICPAES									
Sulfate as SO4 2-	14808-79-8	10	mg/kg		20	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		150	----	----	----	----

Inter-Laboratory Testing

Analysis conducted by ALS Brisbane, NATA accreditation no. 825, site no. 818 (Chemistry) 18958 (Biology).

(SOIL) EA037: Ass Field Screening Analysis

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

(SOIL) EA002: pH 1:5 (Soils)

(SOIL) ED040S : Soluble Sulfate by ICPAES

(SOIL) ED045G: Chloride by Discrete Analyser

(SOIL) EA010: Conductivity (1:5)

(SOIL) EA080: Resistivity

QUALITY CONTROL REPORT

Work Order	: ES2102972	Page	: 1 of 3
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR SIMON BAKER	Contact	: Grace White
Address	: 16 CALLISTEMON CLOSE WARABROOK NEWCASTLE 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 754-NTLGE282700 NEWCASTLE GRAMMAR	Date Samples Received	: 29-Jan-2021
Order number	: ----	Date Analysis Commenced	: 02-Feb-2021
C-O-C number	: ----	Issue Date	: 09-Feb-2021
Sampler	: HAROLD LEE/SAM RAMSEY		
Site	:		
Quote number	: EN/222		
No. of samples received	: 23		
No. of samples analysed	: 18		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Ben Felgendrejeris	Senior Acid Sulfate Soil Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA002: pH 1:5 (Soils) (QC Lot: 3490015)									
ES2102972-011	GBH03 4.5m	EA002: pH Value	----	0.1	pH Unit	6.4	6.4	0.00	0% - 20%
ES2102972-001	GBH02 2.5m	EA002: pH Value	----	0.1	pH Unit	6.5	6.6	0.00	0% - 20%
EA010: Conductivity (1:5) (QC Lot: 3490016)									
ES2102972-011	GBH03 4.5m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	301	307	1.97	0% - 20%
ES2102972-001	GBH02 2.5m	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	19	19	0.00	0% - 50%
EA037: Ass Field Screening Analysis (QC Lot: 3492945)									
ES2102972-001	GBH02 2.5m	EA037: pH (F)	----	0.1	pH Unit	7.0	7.0	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	2.8	2.8	0.00	0% - 20%
ES2102972-011	GBH03 4.5m	EA037: pH (F)	----	0.1	pH Unit	7.0	6.9	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	1.9	1.9	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3490019)									
ES2102972-001	GBH02 2.5m	EA055: Moisture Content	----	0.1	%	19.5	18.2	6.60	0% - 50%
ES2102972-011	GBH03 4.5m	EA055: Moisture Content	----	0.1	%	39.6	39.3	0.833	0% - 20%
ED040S: Soluble Major Anions (QC Lot: 3490017)									
ES2102972-010	GBH03 3.0m	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	<10	0.00	No Limit
ES2102972-001	GBH02 2.5m	ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	20	20	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 3490018)									
ES2102972-011	GBH03 4.5m	ED045G: Chloride	16887-00-6	10	mg/kg	610	650	5.64	0% - 50%
ES2102972-001	GBH02 2.5m	ED045G: Chloride	16887-00-6	10	mg/kg	20	20	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EA002: pH 1:5 (Soils) (QCLot: 3490015)								
EA002: pH Value	----	----	pH Unit	----	4 pH Unit	101	98.0	102
				----	7 pH Unit	100	98.0	102
EA010: Conductivity (1:5) (QCLot: 3490016)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	98.2	97.0	103
ED040S: Soluble Major Anions (QCLot: 3490017)								
ED040S: Sulfate as SO4 2-	14808-79-8	10	mg/kg	<10	750 mg/kg	100	90.0	114
ED045G: Chloride by Discrete Analyser (QCLot: 3490018)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	103	83.0	119
				<10	5000 mg/kg	107	83.0	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2102972	Page	: 1 of 5
Client	: COFFEY ENVIRONMENTS PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: MR SIMON BAKER	Telephone	: +61 2 8784 8555
Project	: 754-NTLGE282700 NEWCASTLE GRAMMAR	Date Samples Received	: 29-Jan-2021
Site	:	Issue Date	: 09-Feb-2021
Sampler	: HAROLD LEE/SAM RAMSEY	No. of samples received	: 23
Order number	: ----	No. of samples analysed	: 18

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.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

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



Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA002: pH 1:5 (Soils)							
Snap Lock Bag - Friable Asbestos/PSD Bag		04-Feb-2021	28-Jan-2021	7	----	----	----
GBH02 4.0m,	GBH02 8.5m,						
GHB02 11.5m,	GBH02 16.0m,						
GBH03 4.5m,	GBH03 7.5m,						
GBH03 12.0m,	GBH03 16.5m						
EA010: Conductivity (1:5)							
Snap Lock Bag - Friable Asbestos/PSD Bag		04-Feb-2021	28-Jan-2021	7	----	----	----
GBH02 4.0m,	GBH02 8.5m,						
GHB02 11.5m,	GBH02 16.0m,						
GBH03 4.5m,	GBH03 7.5m,						
GBH03 12.0m,	GBH03 16.5m						
EA037: Ass Field Screening Analysis							
Snap Lock Bag - Friable Asbestos/PSD Bag		04-Feb-2021	22-Jan-2021	13	04-Feb-2021	22-Jan-2021	13
GBH02 2.5m,	GBH02 4.0m,						
GBH02 8.5m,	GHB02 10.0m,						
GHB02 11.5m,	GHB02 14.5m,						
GBH02 16.0m,	GBH02 17.5m,						
GBH02 19.0m,	GBH03 3.0m,						
GBH03 4.5m,	GBH03 7.5m,						
GBH03 10.5m,	GBH03 12.0m,						
GBH03 15.0m,	GBH03 16.5m,						
GBH03 18.0m,	GBH03 19.5m						

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; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002: pH 1:5 (Soils)							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA002) GBH02 4.0m, GBH02 8.5m, GBH02 11.5m, GBH02 16.0m, GBH03 4.5m, GBH03 7.5m, GBH03 12.0m, GBH03 16.5m	21-Jan-2021	04-Feb-2021	28-Jan-2021	✖	04-Feb-2021	04-Feb-2021	✓
EA010: Conductivity (1:5)							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA010) GBH02 4.0m, GBH02 8.5m, GBH02 11.5m, GBH02 16.0m, GBH03 4.5m, GBH03 7.5m, GBH03 12.0m, GBH03 16.5m	21-Jan-2021	04-Feb-2021	28-Jan-2021	✖	04-Feb-2021	04-Mar-2021	✓
EA037: Ass Field Screening Analysis							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA037) GBH02 2.5m, GBH02 4.0m, GBH02 8.5m, GBH02 10.0m, GBH02 11.5m, GBH02 14.5m, GBH02 16.0m, GBH02 17.5m, GBH02 19.0m, GBH03 3.0m, GBH03 4.5m, GBH03 7.5m, GBH03 10.5m, GBH03 12.0m, GBH03 15.0m, GBH03 16.5m, GBH03 18.0m, GBH03 19.5m	21-Jan-2021	04-Feb-2021	22-Jan-2021	✖	04-Feb-2021	22-Jan-2021	✖
EA055: Moisture Content (Dried @ 105-110°C)							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA055) GBH02 4.0m, GBH02 8.5m, GBH02 11.5m, GBH02 16.0m, GBH03 4.5m, GBH03 7.5m, GBH03 12.0m, GBH03 16.5m	21-Jan-2021	----	----	----	02-Feb-2021	04-Feb-2021	✓
ED040S : Soluble Sulfate by ICPAES							
Snap Lock Bag - Friable Asbestos/PSD Bag (ED040S) GBH02 4.0m, GBH02 8.5m, GBH02 11.5m, GBH02 16.0m, GBH03 4.5m, GBH03 7.5m, GBH03 12.0m, GBH03 16.5m	21-Jan-2021	04-Feb-2021	18-Feb-2021	✓	09-Feb-2021	04-Mar-2021	✓
ED045G: Chloride by Discrete Analyser							
Snap Lock Bag - Friable Asbestos/PSD Bag (ED045G) GBH02 4.0m, GBH02 8.5m, GBH02 11.5m, GBH02 16.0m, GBH03 4.5m, GBH03 7.5m, GBH03 12.0m, GBH03 16.5m	21-Jan-2021	04-Feb-2021	18-Feb-2021	✓	09-Feb-2021	04-Mar-2021	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH (1:5)	EA002	2	8	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Anions - Soluble	ED040S	1	8	12.50	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
pH (1:5)	EA002	SOIL	In house: Referenced to Rayment and Lyons 4A1 and APHA 4500H+. pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM Schedule B(3).
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
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 Schedule B(3).
Resistivity (1:5)	EA080	SOIL	In house: Calculated from Electrical Conductivity
Major Anions - Soluble	ED040S	SOIL	In house: Soluble Anions are determined off a 1:5 soil / water extract by ICPAES.
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Preparation Methods	Method	Matrix	Method Descriptions
Drying only	EN020D	SOIL	In house
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.

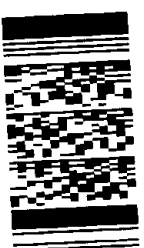
coffey NITRA TECH COMPANY		Consigning Office: Warabrook		Mobile: 0427 628 117		Email: simon.baker@coffey.com	
Project No: 754-NITGEZ82007		Task No:		Report Results to: <u>Simon Baker</u>		Invoices to: <u>Newcastle Accounts</u>	
Project Name: Newcastle Grammar		Laboratory: ALS		Lab		Phone: 02 4028 9700	
Sampler's Name: Harold Lee / Sam Ramsey		Project Manager: Simon Baker / Craig Schrader		Analysis Request Section		Email: newcastle@coffey.com	
Special Instructions: Keep samples for Chromium Reducible Sulphur testing at a later date							

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil, etc)	Container Type & Preservative*	T-A-T (specify)	Agressivity Suite	ph field screen (phf and phfox)	Asbestos P/A	HOLD	NOTES
1	GBH02 2.5m	21-01-21	-	Soil	Z	Std		X			
2	GBH02 4.0m	21-01-21	-	Soil	Z	Std		X			
3	GBH02 8.5m	21-01-21	-	Soil	Z	Std		X			
4	GBH02 10.0m	21-01-21	-	Soil	Z	Std		X			
5	GBH02 11.5m	21-01-21	-	Soil	Z	Std		X			
6	GBH02 14.5m	21-01-21	-	Soil	Z	Std		X			
7	GBH02 16.0m	21-01-21	-	Soil	Z	Std		X			
8	GBH02 17.5m	21-01-21	-	Soil	Z	Std		X			
9	GBH02 19.0m	21-01-21	-	Soil	Z	Std		X			
10	GBH03 3.0m	21-01-21	-	Soil	Z	Std		X			
11	GBH03 4.5m	21-01-21	-	Soil	Z	Std		X			
12	GBH03 7.5m	21-01-21	-	Soil	Z	Std		X			
13	GBH03 10.5m	21-01-21	-	Soil	Z	Std		X			
14	GBH03 12.0m	21-01-21	-	Soil	Z	Std		X			
15	GBH03 15.0m	21-01-21	-	Soil	Z	Std		X			
16	GBH03 16.5m	21-01-21	-	Soil	Z	Std		X			
17	GBH03 18.0m	21-01-21	-	Soil	Z	Std		X			
18	GBH03 19.5m	21-01-21	-	Soil	Z	Std		X			

RELINQUISHED BY		RECEIVED BY	
Name: Harold Lee	Date: 29/01/21	Name: <u>MM</u>	Date: <u>29/01/21</u>
Time:		Time: <u>2:30pm</u>	

Coffey Environments		Name: <u>MM</u>		Date: <u>29/01/21</u>	Time: <u>07:30pm</u>
Name: <u>MM</u>	Date: <u>29/01/21</u>	Name: <u>Adana</u>	Date: <u>29/01/21</u>	Time: <u>07:30pm</u>	
Company:	Time:	Company:	Time:		

* Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative



Environmental Division
Sydney
Work Order Reference
ES2102972

Telephone : + 61-2-8784 8655

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/ Batch No. 5.701

LAB OF ORIGIN:
NEWCASTLE

coffey TETRA TECH COMPANY		Consigning Office: Warabrook		Report Results to: Simon Baker		Mobile: 0427 628 117		Email: simon.baker@coffey.com	
Project No: 754-NITIGCE282007		Task No:		Invoices to: Newcastle Accounts		Phone: 02 4028 9700		Analysis Request Section	
Project Name: Newcastle Grammar		Laboratory: AUS		Sample's Name: Harold Lee / Sam Ramsey		Project Manager: Simon Baker / Craig Schrader			
Special Instructions: Keep samples for Chromium Reducible Sulphur testing at a later date									

Lab No.	Sample ID	Sample Date	Time	Matrix (Soil, etc)	Container Type & Preservative*	T-A-T (Specify)	Agressivity Suite	ph field screen (phf and phfox)	Asbestos P/A	HOLD	NOTES
1	GBH02 2.5m	21-01-21	-	Soil	Z	Std	X	X			
2	GBH02 4.0m	21-01-21	-	Soil	Z	Std	X	X			
3	GBH02 8.5m	21-01-21	-	Soil	Z	Std	X	X			
4	GBH02 10.0m	21-01-21	-	Soil	Z	Std	X	X			
5	GBH02 11.5m	21-01-21	-	Soil	Z	Std	X	X			
6	GBH02 14.5m	21-01-21	-	Soil	Z	Std	X	X			
7	GBH02 16.0m	21-01-21	-	Soil	Z	Std	X	X			
8	GBH02 17.5m	21-01-21	-	Soil	Z	Std	X	X			
9	GBH02 19.0m	21-01-21	-	Soil	Z	Std	X	X			
10	GBH03 3.0m	21-01-21	-	Soil	Z	Std	X	X			
11	GBH03 4.5m	21-01-21	-	Soil	Z	Std	X	X			
12	GBH03 7.5m	21-01-21	-	Soil	Z	Std	X	X			
13	GBH03 10.5m	21-01-21	-	Soil	Z	Std	X	X			
14	GBH03 12.0m	21-01-21	-	Soil	Z	Std	X	X			
15	GBH03 15.0m	21-01-21	-	Soil	Z	Std	X	X			
16	GBH03 16.5m	21-01-21	-	Soil	Z	Std	X	X			
17	GBH03 18.0m	21-01-21	-	Soil	Z	Std	X	X			
18	GBH03 19.5m	21-01-21	-	Soil	Z	Std	X	X			

Environmental Division
Sydney
Work Order Reference
ES2102972

Telephone : + 61-2-8784 9555

Name: Harold Lee		Date: 29/01/21	Name: MM		Date: 29/01/21
Coffey Environments		Time: 29/01/21	Company: MM		Time: 2:30pm
Name: MM		Date: 29/01/21	Name: Amanda		Date: 29/01/21
Company: MM		Time: 29/01/21	Company: Amanda		Time: 07:30pm

*Container Type & Preservation Codes: P - Plastic, G - Glass Bottle, J - Glass Jar, V - Vial, Z - Ziplock bag, N - Nitric Acid Preserved, C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice, ST - Sodium Thiosulfate, NP - No Preservative

19 GBH02-10
20 GBH02-70
21 GBH02-130
22 GBH03-15
23 GBH03-60

LAB OF ORIGIN:
NEWCASTLE

Sample Receipt Advice: (Lab Use Only)

All Samples Received in Good Condition ☐

All Documentation is in Proper Order ☐

Samples Received Properly Chilled ☐

Lab. Ref/Batch No.

5-700

Appendix K - Statistical Appraisal (Lead)

	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	From File			WorkSheet.wst								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												
9	Lead											
10												
11	General Statistics											
12	Number of Valid Data				23		Number of Detected Data				21	
13	Number of Distinct Detected Data				20		Number of Non-Detect Data				2	
14							Percent Non-Detects				8.70%	
15												
16	Raw Statistics					Log-transformed Statistics						
17	Minimum Detected				5.5		Minimum Detected				1.705	
18	Maximum Detected				380		Maximum Detected				5.94	
19	Mean of Detected				66.41		Mean of Detected				3.42	
20	SD of Detected				92.34		SD of Detected				1.271	
21	Minimum Non-Detect				5		Minimum Non-Detect				1.609	
22	Maximum Non-Detect				5		Maximum Non-Detect				1.609	
23												
24												
25	UCL Statistics											
26	Normal Distribution Test with Detected Values Only					Lognormal Distribution Test with Detected Values Only						
27	Shapiro Wilk Test Statistic				0.676		Shapiro Wilk Test Statistic				0.94	
28	5% Shapiro Wilk Critical Value				0.908		5% Shapiro Wilk Critical Value				0.908	
29	Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level						
30												
31	Assuming Normal Distribution					Assuming Lognormal Distribution						
32	DL/2 Substitution Method						DL/2 Substitution Method					
33	Mean				60.85		Mean				3.202	
34	SD				89.95		SD				1.411	
35	95% DL/2 (t) UCL				93.06		95% H-Stat (DL/2) UCL				169.4	
36												
37	Maximum Likelihood Estimate(MLE) Method					Log ROS Method						
38	Mean				55.95		Mean in Log Scale				3.158	
39	SD				93.61		SD in Log Scale				1.493	
40	95% MLE (t) UCL				89.46		Mean in Original Scale				60.77	
41	95% MLE (Tiku) UCL				87.32		SD in Original Scale				90	
42							95% t UCL				93	
43							95% Percentile Bootstrap UCL				93.43	
44							95% BCA Bootstrap UCL				102.3	
45							95% H UCL				200.9	
46												
47	Gamma Distribution Test with Detected Values Only					Data Distribution Test with Detected Values Only						
48	k star (bias corrected)				0.691		Data Follow Appr. Gamma Distribution at 5% Significance Level					
49	Theta Star				96.14							
50	nu star				29.01							
51												

	A	B	C	D	E	F	G	H	I	J	K	L
52	A-D Test Statistic					0.931	Nonparametric Statistics					
53	5% A-D Critical Value					0.782	Kaplan-Meier (KM) Method					
54	K-S Test Statistic					0.782	Mean					
55	5% K-S Critical Value					0.197	SD					
56	Data follow Appr. Gamma Distribution at 5% Significance Level						SE of Mean					
57							95% KM (t) UCL					
58	Assuming Gamma Distribution						95% KM (z) UCL					
59	Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL					
60	Minimum					0.000001	95% KM (bootstrap t) UCL					
61	Maximum					380	95% KM (BCA) UCL					
62	Mean					60.63	95% KM (Percentile Bootstrap) UCL					
63	Median					20	95% KM (Chebyshev) UCL					
64	SD					90.1	97.5% KM (Chebyshev) UCL					
65	k star					0.302	99% KM (Chebyshev) UCL					
66	Theta star					201						
67	Nu star					13.87	Potential UCLs to Use					
68	AppChi2					6.485	95% KM (Chebyshev) UCL					
69	95% Gamma Approximate UCL (Use when $n \geq 40$)					129.7						
70	95% Adjusted Gamma UCL (Use when $n < 40$)					137.4						
71	Note: DL/2 is not a recommended method.											
72												
73	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
74	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
75	For additional insight, the user may want to consult a statistician.											
76												