Contamination and Preliminary Waste Classification Assessment

Max McMahon Oval, Rutherford NSW

NEW22P-0130-AA 12 August 2022



**GEOTECHNICAL I LABORATORY I EARTHWORKS I QUARRY I CONSTRUCTION MATERIAL TESTING** 

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# **Executive Summary**

Qualtest Laboratory NSW Pty Ltd (Qualtest) carried out a Contamination and Preliminary Waste Classification Assessment for EJE Architecture Pty Ltd (EJE) on behalf of Maitland City Council for a site located at Max McMahon Oval, off Weblands Street, Rutherford, NSW (the site).

It is proposed to construct a new amenities building at Max McMahon Oval. The new amenities building will be located within an approximately 2,400m<sup>2</sup> development area, located in the central west of Lot 3, DP 232261.

A contamination assessment was required to support a Development Application to Maitland City Council for the proposed amenities building. In addition, a preliminary waste classification of the in-situ soils was requested to assist with planning.

The objectives of the assessment were to:

- Provide an assessment of whether the in-situ material on the site was suitable for re-use on the site from a contamination perspective (onsite open space land use);
- Provide a preliminary waste classification assessment of the material; and
- Provide recommendations on the need for further assessment, management and/or remediation (if required).

In order to achieve the above objectives, Qualtest carried out the following scope:

- Site walkover;
- Limited desktop study to assess past uses of the site;
- Drilling of nine boreholes (BH01 to BH09) and collection of soil samples;
- Laboratory analysis of selected soil samples; and
- Data assessment and preparation of this Contamination and Preliminary Waste Classification Report.

Based on the results of the work completed as part of this assessment, the in-situ material is considered suitable for onsite reuse in accordance with ASC NEPM 2013 guidelines for public open space land uses.

Based on the preliminary waste classification assessment, the surface soils and fill materials across the site classify as General Solid Waste (non-putrescible). The underlying residual soils and weathered rock would likely classify as Virgin Excavated Natural Material (VENM), as long as they are not mixed with any topsoil, fill, or waste materials.

If conditions other than those encountered during this assessment are uncovered, further assessment by an environmental consultant may be necessary.

This report was prepared in general accordance with the relevant sections of the NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Land, the National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013, Canberra (referred to as ASC NEPM 2013), and NSW EPA (2014) Waste Classification Guidelines.

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# 1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) carried out a Contamination and Preliminary Waste Classification Assessment for EJE Architecture Pty Ltd (EJE) on behalf of Maitland City Council for a site located at Max McMahon Oval, off Weblands Street, Rutherford, NSW (the site). The site location is shown on Figure 1, Appendix A.

It is proposed to construct a new amenities building at Max McMahon Oval. The new amenities building will be located within an approximately 2,400m<sup>2</sup> development area, located in the central west of Lot 3, DP 232261.

A contamination assessment was required to support a Development Application to Maitland City Council for the proposed amenities building. In addition, a preliminary waste classification of the in-situ soils was requested to assist with planning.

This report was prepared in general accordance with the relevant sections of the NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Land, the National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013, Canberra (referred to as ASC NEPM 2013), and NSW EPA (2014) Waste Classification Guidelines.

#### 1.1 Objectives

The objectives of the assessment were to:

- Provide an assessment of whether the in-situ material on the site was suitable for re-use on the site from a contamination perspective (onsite open space land use);
- Provide a preliminary waste classification assessment of the material; and
- Provide recommendations on the need for further assessment, management and/or remediation (if required).

#### 1.2 Scope of Works

In order to achieve the above objectives, Qualtest carried out the following scope:

- Site walkover;
- Limited desktop study to assess past uses of the site;
- Drilling of nine boreholes (BH01 to BH09) and collection of soil samples;
- Laboratory analysis of selected soil samples; and
- Data assessment and preparation of this Contamination and Preliminary Waste Classification Report.

# 2.0 Site Description

#### 2.1 Site Identification

General site information is provided below in Table 2.1. The site location is shown in Figure 1, Appendix A.

Site Address:	Max McMahon Oval Off Weblands Street, Rutherford NSW
Approximate site area and dimensions:	Approx. 2,400m <sup>2</sup> Approx. 25m wide by 115m long at its widest and longest points.
Title Identification Details:	Part of Lot 3, DP 232261 within the Maitland City Council local government area.
Current Zoning	RE1 Public Recreation
Current Ownership:	Maitland City Council
Current Occupier:	Max McMahon Oval Sport Complex
Previous and Current Landuse:	Max McMahon Oval Sport Complex - Recreational/ open space
Proposed Landuse:	Max McMahon Oval Sport Complex - Recreational/ open space
Adjoining Site Uses (Adjoining Sports Complex):	Rutherford High School and Rutherford Public School to the north, and residential to the south, east and west.
Site Coordinates for approx. centre of site:	32°42'46.92 S 151°31'46.91 E

Table 2.1: Summary of Site Details

## 2.2 Topography and Drainage

Reference to the NSW Land and Property Information Spatial Information Exchange website (<u>https://six.nsw.gov.au/wps/portal/</u>) indicated the elevation of the site was approximately between 40m and 45m AHD.

The site was observed to slope from the west to east. Rain falling on the site would be expected to infiltrate into the site surface. Excess surface water was expected to follow the site topography, and eventually drain into a municipal stormwater drain, located along Avery Street, located to the east of the site.

### 2.3 Geology and Soils

Reference to the 1:100,000 Newcastle-Hunter Quaternary Geology Sheet (2007) indicates the site is underlain by the Maitland Group comprising quartz-lithic sandstone (sporadic marine fossils), polymictic pebble to cobble-paraconglomerate, siltstone, fossiliferous siltstone, minor claystone and chert.

#### 2.4 Hydrogeology

Groundwater beneath the site was anticipated to be present in a semi-confined aquifer in residual soils and/or weathered rock. Groundwater was expected to be present on the site at depths greater than 5m below ground surface (bgs). Groundwater flow direction was anticipated to flow towards an unnamed creek located approximately 370m east of the site.

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

A search of the NSW Department of Primary Industries (Office of Water) registered groundwater bores located within a 500m radius of the site was undertaken. The search revealed that there were four bores within this radius. A summary of the information available for the bores is provided in Table 2.4 below. A copy of the search is provided in Appendix C.

Bore ID	Installation Date	Purpose	Approx. Distance and Gradient from Site	Water Bearing Zones (mbgs)
GW202692	16/08/2011	Monitoring Bore	430m W, up-gradient	6.0 - 9.0*
GW202693	16/08/2011	Monitoring Bore 430m W, up-gradient		4.5 to 7.5*
GW202694	16/08/2011	Monitoring Bore	430m W, up-gradient	4.45 – 7.45*
GW203443	01/06/2015	Stock, irrigation	175m N, cross gradient	60.00 - 61.00

Table 2.4 – Summary of Registered Groundwater Bore Information

Note: \*water bearing zone based on depth range of slotted PVC in monitoring well. NK – not known; N – North, E – East, S – South, W – West

#### 2.5 Acid Sulfate Soils

Reference to the Acid Sulfate Soil online database from State of NSW and Department of Planning, Industry and Environment, 2021 (https://espade.environment.nsw.gov.au) the site is located in an area of 'no known occurrence' of acid sulfate soils.

## 3.0 Previous Reports

Qualtest has not been provided with or been made aware of any previous assessment conducted on the site.

#### 4.0 Site Observations

A Qualtest Environmental Scientist carried out a site walkover to assess site features. A summary of the site features is outlined below:

- The site was observed to slope from the western portion to the eastern portion of the site.
- A grandstand and amenities block were observed in the central portion of the site and comprised of concrete block walls, concrete floor slab and stairs, and steel/wooden roofing and seating;
- The remainder of the site was mostly well-maintained grass or concrete pavement; and
- Steel fencing was observed on the western side of the grandstand and amenities block.

Photographs taken during field works are shown below.



facing north.

north.



Photograph 3: Central portion of site, facing Photograph 4: Central portion of site, facing south. north.

# 5.0 Aerial Photograph Review

Aerial photographs of the site from 1944, 1954, 1974, 1984 and 1993 obtained from the NSW Government Spatial Portal (<u>https://portal.spatial.nsw.gov.au/</u>), and satellite images from Google Earth for 2001, 2010 and 2022 were assessed by a Qualtest Environmental Scientist. The results of the aerial photograph review are summarised below in Table 5.1. The aerial photographs are presented in Appendix C.

Year	Site	Surrounding Land
1944	The site appears to be mostly undeveloped cleared land.	The surrounding land appears to be mostly cleared land, with some scattered trees. Mostly rural residential land in each direction.
1954	The site is similar to the previous photograph.	The surrounding area appears similar to the previous aerial photograph.
1974	A structure has been developed in the central portion of the site, which looks	A sports oval has been developed to the immediate east.
	today.	Residential housing and road infrastructure has been developed to the south, east, west, north and north west.
		Surrounding roads appear to have been paved.
1984	The site is similar to the previous photograph.	A residential housing development is under construction to the north.
		Housing density has increased to the north- east.
1993	Two new structures have been constructed. One is observed in the northern portion and the second appears to be immediately south of the original structure in the central portion.	The development to the north appears to be completed. The remaining surrounding area appears similar to the previous aerial photograph.
2001	The site is similar to the previous photograph.	The surrounding area appears similar to the previous aerial photograph.
2010	The site is similar to the previous photograph.	The surrounding area appears similar to the previous aerial photograph.
2022	The structure located in the northern portion has had a change of roof colour, possibly rust affected.	A large building, possibly a school has been developed to the north-west. The remaining surrounding area appears similar to the previous aerial photograph.

Table	5.1:	Aerial	Photograph	Review
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# 6.0 Data Quality Objectives

#### 6.1 Step 1 – State the Problem

Potential for contaminated soil to be present on the site, that is not suitable for onsite reuse. The waste classification for material that may require disposal offsite is not known.

#### 6.2 Step 2 – Identify the Decisions

The decisions to be made are:

- Is the site contaminated with respect to the proposed landuse criteria and are there exposure pathways to receptors;
- Will the site require remediation, and if so, what level and type of remediation will be required to make the site suitable for the proposed land use, from a contamination perspective?
- What is the preliminary waste classification for the soil?

#### 6.3 Step 3 – Identify the Inputs to the Decisions

Inputs into the decision are:

- Have samples been collected in the required areas of the site?
- Have samples been collected at the required frequencies and adequately represent the conditions on site?
- Is the data set adequate to perform statistical analysis, if required (i.e. calculate 95% UCL)
- Have the samples been analysed for the COPCs identified?
- Have concentrations exceeding the adopted criteria been reported in the samples?
- If concentrations exceeding adopted criteria have been reported, will these areas require remediation and/or management?

The informational inputs into the decision are:

- Field observations and field screening results;
- Laboratory results (concentrations of contaminants in soil);
- QA/QC documentation and data;
- Adopted assessment criteria (see Section 8); and,
- Relevant NSW EPA endorsed Guidelines.

Media to be sampled and analysed is:

• Soil.

Based on the requirements of the current assessment, groundwater, surface water and/or soil gases are not required to be assessed.

#### 6.4 Step 4 – Define the Study Boundaries

The study boundary is defined laterally as the site boundary, located in part of Lot 3, DP 232261 within the Maitland City Council government area. The site is located off Weblands Street, Rutherford, NSW and covers an area of approximately 2,400m<sup>2</sup> (refer to Figure 1, Appendix A). Vertically, the study boundary will be defined by the depth of anticipated excavation depth. It is anticipated the vertical boundary would be a maximum of 2.0m bgs.

Temporally the study boundaries are the day of sampling, 14 July 2022.

#### 6.5 Step 5 – Develop a Decision Rule

Chemicals of Potential Concern (COPCs) identified for the site are based on common contaminants and include:

- Heavy Metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc, mercury);
- Total Recoverable Hydrocarbons (TRH);
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH); and
- Asbestos.

The decision rules can be defined as: -

- If the laboratory quality assurance/ quality control data are within the acceptable ranges, the data will be considered suitable for use;
- If the COPCs are reported above the adopted criteria and/or at elevated levels (where no criteria are available) then it will be considered whether further assessment, remediation and/or management measures are required;
- Where concentrations are below the assessment criteria, then no further assessment, remediation and/or management of that contaminant, in that area, in that media, is required; and,
- The preliminary waste classification will be based on concentrations of COPC compared to waste classification criteria.

#### 6.6 Step 6 – Specify Acceptable Limits on Decision Errors

There are two types of errors:

- Type 1 finding that the site is contaminated, when it is not;
- Type 2 finding that the site is uncontaminated, when it is.

To reduce the potential for errors, the following will be applied:

- Appropriate field sampling methodologies and collection of field data;
- Robust QA/QC assessment of field procedures and laboratory data;
- Appropriate sampling and analytical density;
- Use of statistics (i.e. 95% UCL) to assess arithmetic average of COPCs. Use of statistics will also take into account:
  - o No sample should report a concentration more than 250% of the adopted criteria; and,
  - The standard deviation of a sample population should not exceed 50% of the adopted criteria.

### 6.7 Step 7 – Optimise the Design for Obtaining Data

The methodologies presented in this report are designed to meet the nominated DQOs. Optimisation of the data collection process will be achieved by:

- Working closely with the analytical laboratories and sampling equipment suppliers so that:
  - appropriate laboratory procedures and processes are developed and implemented prior to and during the field work; and
  - that sampling, handling, and transport to, and processing by, the analytical laboratories is appropriate.
- Conduct sampling in accordance with industry best practice and Standard Operating Procedures (SOPs) for the type of sampling being conducted.

## 7.0 Field and Laboratory Investigations

#### 7.1 Sampling Plan

The NSW EPA (1995) Sampling Design Guidelines recommends a minimum of nine sampling locations to characterise an area of 2,400m<sup>2</sup>, this sampling density has been adopted. The boreholes were spread across the site, excluding the areas of existing buildings.

The location of the boreholes are shown on Figure 2, Appendix A. The borehole logs are presented in Appendix D.

#### 7.2 Soil Sampling

Nine boreholes (BH01 to BH09) locations were drilled on the site. The boreholes were drilled using a 2.7 mini-excavator equipped with a 300mm diameter auger attachment. Soil samples were at about 0.5m intervals.

Soil samples were collected directly from the auger. A clean pair of disposable gloves was used whilst handling each new sample.

At the surface (0.0-0.1m) of each borehole asbestos samples were collected using the gravimetric method, comprising collection of a 10L sample, screening through a 6.7mm sieve, and weighing of potential ACM fragments (where present).

The soil samples were placed into 250mL laboratory supplied glass jars and the samples for asbestos testing were placed in dedicated asbestos sampling plastic zip-lock bags for laboratory analysis. Each sample was placed directly into an ice-chilled esky and remained chilled during transportation to the laboratory.

#### 7.3 Laboratory Analysis

The samples were dispatched to the NATA-accredited Eurofins laboratory under chain of custody conditions. The soil samples were analysed for the following:

- Total Recoverable Hydrocarbons (TRH) 9 primary soil samples;
- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) 9 primary soil samples;
- Polycyclic Aromatic Hydrocarbons (PAHs) 9 primary soil samples;
- Metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury) 9 primary soil samples;

- TCLP benzo(a)pyrene 1 primary soil sample; and,
- Asbestos (Quantitative %w/w) 9 primary soil samples.

For quality control samples, see Section 9.

#### 8.0 Assessment Criteria

#### 8.1 Exposure Scenario

The site is proposed to be redeveloped for a new amenities building. This type of development is considered to represent recreational/open space land use.

#### 8.2 Health and Ecological Levels (Soil)

To assess whether the material is suitable for re-use on-site, the laboratory results were compared to the health and ecological investigation levels for soil, presented in the National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013, Canberra (referred to as ASC NEPM 2013).

ASC NEPM (2013) provides health and ecological investigation and screening levels for different exposure scenarios based on a proposed land use. They are adopted as concentrations of a contaminant above which either further appropriate investigation and/or evaluation will be required, or development of an appropriate management strategy (including remediation).

Health Investigation Levels (HILs) and Health Screening levels (HSLs) are applicable for assessing human health risk via relevant exposure pathways. The HILs were developed for a broad range of metals and organic substances. These are generic to all soil types. The HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation and direct contact with soil and groundwater. The HSLs depend on specific soil physicochemical properties, building configurations, land use scenarios and the depth that groundwater is encountered.

Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) are applicable for assessing risk to terrestrial ecosystems under residential, open space and commercial/industrial land use scenarios. They apply to the top 2m of soil, which corresponds to the root zone and habitation zone of many species. The EILs are associated with selected metals and organic compounds. The EILs are site specific and are determined by calculating an Ambient Background Concentration (ABC) and an Added Contaminant Limit (ACL) for the site, which are added together to get the EIL. The EIL's for the site have been calculated using an ABC and site specific pH, Cation Exchange Capacity (CEC) and clay content values. The ABC obtained from Trace element concentrations in soils from rural and urban areas of Australia.

It is noted the ESLs for benzo(a)pyrene (ASC NEPM, 2013) were adopted from Canadian Soil Quality Guidelines (SQGs) presented in Environment Canada (2004), and were noted to have a low-reliability. The ESLs for benzo(a)pyrene in ASC NEPM (2013) were based on a review of Canadian SQGs by Dr Michael Warne, who completed the review in February 2010. Since the completion of Warne (2010) (which are included in the publication of ASC NEPM, 2013), the Canadian SQGs for benzo(a)pyrene were revised later in 2010 (CCME 2010a,b). Therefore, CRC Care Technical Note 39 assesses the benzo(a)pyrene ESL derivation, and derives a higher reliability ESL for benzo(a)pyrene in the Australian setting. The ESLs for benzo(a)pyrene derived by CRC Care (2017) are 33mg/kg for residential and open space land uses, and 172mg/kg for commercial/industrial land uses. These have been considered where benzo(a)pyrene concentrations exceed the ESL, but do not exceed the HIL, to mitigate against unwarranted remediation that is driven by low-reliability ESLs. Based on the current and proposed site use (open space with sporting fields and amenities buildings) the following investigation levels have been adopted:

- HIL C & HSL C Public open space (parks, playgrounds, playing fields, secondary schools and footpaths) and;
- EIL C, ESL C urban residential / public open space.

#### 8.3 Asbestos Materials in Soil

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

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

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

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

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

The adopted health screening levels for asbestos for recreational landuse scenario, is shown in Table 8.3, below.

Form of Asbestos	Health Screening Level		
	Recreational/Open Space (HSL C)		
Bonded ACM (%)	0.02		
FA and AF (%)	0.001		
All forms of Asbestos	No visible evidence for surface soil (top 10cm)		

 Table 8.3 Health Screening Levels for Asbestos Contamination in Soil (NEPM 2013)

#### 8.4 Preliminary Waste Classification

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

# 9.0 Quality Assurance/Quality Control

Sampling activities were undertaken in accordance with normal, industry accepted practices and standards and carried out by appropriately trained personnel. The assessment of field and laboratory quality assurance / quality control (QA / QC) procedures is provided below, and a data validation report is presented in Appendix E.

#### 9.1 Holding Times

Samples were extracted and analysed within the holding times.

#### 9.2 Field QC Samples

In order to assess field quality assurance / quality control (QA/QC) procedures, the following quality control samples were collected and analysed:

QC Sample	Туре	Lab	Analysis
D.17.07.22	Duplicate of BH01 0.0-0.1	Eurofins	TRHs, BTEX, PAHs, Metals.

Primary and intra lab duplicate samples were analysed by the NATA-accredited Eurofins laboratory. The number of duplicate samples collected was in accordance with the ASC NEPM (2013) requirement of at least 1 duplicate per 20 primary samples.

Table 4, Appendix B presents the relative percentage differences (RPDs) between the primary and duplicate soil samples. A review of the Qualtest QA / QC results indicates that RPDs were within the acceptable ranges. It is noted that low concentrations exaggerate the percentage differences with respect to small total concentrations, therefore where results for primary and duplicate sample were less than 10 times the LOR, the RPDs have been disregarded.

#### 9.3 Laboratory QA/QC

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

- Laboratory blank samples were free of contamination;
- Matrix spike recoveries were within the control limits;
- Laboratory duplicate RPDs were recorded within the laboratory control limits; and
- Surrogates and laboratory control samples were within the laboratories acceptable range.

#### 9.4 Data Usability

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

# 10.0 Results

### **10.1 Subsurface Conditions**

The soils observed during drilling are summarised below in Table 10.1 and Table 10.2. The borehole logs are presented in Appendix D.

Unit	Soil Type	Description
		Sandy CLAY – medium to high plasticity, brown, fine to medium grained sand, with some fine grained angular gravel, root affected.
1A	/ TOPSOIL	brown, fines of low plasticity, root affected.
		Sandy CLAY – low to medium plasticity, dark grey-brown, fine to medium grained sand, root affected.
1B	FILL	Sandy CLAY – medium plasticity, generally dark grey-brown to pale brown, fine to coarse grained sand, with some fine to medium grained angular gravel, with some roots in places.
		Clayey SAND – fine to medium grained, brown, fines of low plasticity.
	residual soil	Sandy CLAY – medium plasticity, brown to orange-brown and pale grey-brown / pale brown and pale red-brown, fine to medium grained sand.
2		CLAY – medium to high plasticity, brown to pale brown with some pale red-brown, with some fine to medium grained sand.
		Clayey SAND – fine grained, pale orange-brown and pale grey- brown, fines of low plasticity.
3	EXTREMELY WEATHERED ROCK (with soil properties)	Silty Sandstone; breaks down into Clayey SAND – fine to medium grained, pale brown to pale orange-brown, fines of low plasticity.
4	HIGHLY WEATHERED	Silty SANDSTONE – fine grained, pale grey and pale orange-brown, estimated low to medium strength.
	ROCK	SANDSTONE – fine grained, brown.

TABLE 10.1 - Summary	of Geotechnical	Units and	Soil Types
TABLE TO.T - SUTTINUE		uni unu	JOILIYPES

Location	Unit 1A FILL-TOPSOIL / TOPSOIL	Unit 1B FILL	Unit 2 Residual Soil	Unit 3 XW Rock	Unit 4 HW Rock								
		Depth in metres (m)											
BH03	0.00 - 0.20	0.20 - 0.40	0.40 - 1.10	1.10 - 1.20	1.20 – 1.45*								
BH05	-	-	0.00 – 0.70	0.70 – 1.00	1.00 – 1.15*								
BH07	0.00 – 0.30	0.30 – 0.40	0.40 – 0.50	-	0.50 – 0.70*								
BH01	0.00 - 0.10	0.10 - 0.40	0.40 - 0.80	-	-								
BH02	0.00 - 0.10	0.10 – 0.30	0.30 – 0.80	-	-								
BH04	0.00 - 0.10	0.10 - 0.40	0.40 - 0.60	-	-								
BH06	-	0.00 - 0.40	0.40 – 0.55	-	0.55 – 0.60*								
BH08	0.00 - 0.25	-	0.25 – 0.60	-	-								
BH09	0.00 - 0.30	0.30 – 0.70	0.70 – 0.80	-	-								

Table 10.2 – Summary of Geotechnical Units Encountered at Each Borehole Location

\* End of hole

No groundwater inflows were observed during drilling.

#### **10.2 Laboratory Results**

#### 10.2.1 Onsite Reuse

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

The soil laboratory results were compared to the investigation levels described in Sections 8.2 and 8.3. The analytical results indicated that concentrations of contaminants were reported below the adopted criteria, with the exception of:

• TRH >C16-C34 exceeded the ESL (300mg/kg) in sample BH04 0.0-0.1 (310mg/kg).

For concentrations of TRH >C16-C34 exceeding the adopted ecological screening levels in surface soils, the 95% Upper Confidence Limits (UCLs) of the average concentrations for the sample results were calculated using ProUCL in accordance with the procedures discussed in NEPM (2013) Schedule B2 Section 13 and NSW EPA (1995) Sampling Design Guidelines.

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

- "At the very least, the maximum and 95%UCL of the arithmetic mean contaminant concentration should be compared to the relevant Tier 1 screening criteria"
- "The implications of localised elevated values (hotspots) should also be considered. The results should also meet the following criteria:
  - The standard deviation of the results should be less than 50% of the relevant investigation or screening level, and
  - No single value should exceed 250% of the relevant investigation or screening level."

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

The 95% UCL calculations showed:

Parameter	TRH >C16-C34 ESL
No. of samples	9
Average	156.7
Standard Deviation	76.32
95% UCL	205.8
EIL (mg/kg)	300

The 95% UCL calculations showed the average and the arithmetic average concentration of TRH >C16-C34 is below the adopted criteria.

#### **10.2.3 Preliminary Waste Classification**

The waste classification results are summarised in Table 3, Appendix B. The laboratory analytical reports are also included in Appendix F.

The soil laboratory results were compared to the investigation levels described in Section 8.4.

Qualtest followed the six-step process described in Part 1 of the NSW EPA (2014) Waste Classification Guidelines for assessing the classification of the surface soils on the site. According to the waste classification procedure:

- Step 1 Is the waste special waste?: The material assessed is not 'special waste'.
- Step 2 Is the waste liquid waste?: The material assessed is not a 'liquid waste' in its current form. The material requiring offsite disposal was soil and capable of being picked up by a spade or shovel.
- Step 3 Is the waste pre-classified?: The material assessed is not 'pre-classified'.
- Step 4 Does the waste possess hazardous characteristics?: The material assessed does not appear to possess hazardous characteristics from the onsite observations made.
- Step 5 Determining a waste's classification using chemical assessment: The material has been assessed by chemical analyses. Soil analytical results are presented in Table 3, Appendix B. The results show concentrations below the general solid waste criteria without TCLP testing (CT1) with the exception of benzo(a)pyrene in samples BH02 0.0-0.1, BH03 0.0-0.1, BH08 0.0-0.1 and BH09 0.0-0.1 which showed concentrations below general solid waste with TCLP (SCC1/TCLP1), and asbestos was not detected.
- Step 6 Is the waste putrescible or non-putrescible?: The material is composed of soil. NSW EPA (2014) notes that materials that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural, forestry and crop materials, and natural fibrous organic and vegetative materials. Based on observations by Qualtest, the material is considered to be non-putrescible.

# **11.0 Conclusions and Recommendations**

Based on the results of the work completed as part of this assessment, the in-situ material is considered suitable for onsite reuse in accordance with ASC NEPM 2013 guidelines for public open space land uses.

Based on the preliminary waste classification assessment, the surface soils and fill materials across the site classify as General Solid Waste (non-putrescible). The underlying residual soils and weathered rock would likely classify as Virgin Excavated Natural Material (VENM), as long as they are not mixed with any topsoil, fill, or waste materials.

If conditions other than those encountered during this assessment are uncovered, further assessment by an environmental consultant may be necessary.

This report was prepared in general accordance with the relevant sections of the NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Land and the National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013, Canberra (referred to as ASC NEPM 2013), and NSW EPA (2014) Waste Classification Guidelines.

### 12.0 Limitations

This report has been prepared by Qualtest for EJE Architecture Pty Ltd on behalf of Maitland City Council based on the objectives and scope of work listed in Sections 1.1 and 1.2. No warranty, expressed or implied, is made as to the information and professional advice included in this report. Anyone using this document does so at their own risk and should satisfy themselves concerning its applicability and, where necessary, should seek expert advice in relation to their particular situation.

The opinions, conclusions and recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Qualtest has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

In preparing this report Qualtest has relied on information contained in searches of government websites and has not independently verified or checked the data contained on these websites.

In preparing this report, current guidelines for assessment and management of contaminated land were followed.

Site conditions may change after the date of this Report. Qualtest does not accept responsibility arising from, or in connection with, any change to the site conditions.

## 13.0 References

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

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

**NSW Department of Primary Industries (Office of Water)** Registered Groundwater Bore Map, accessed from <u>http://allwaterdata.water.nsw.gov.au/water.stm</u>, accessed on 22 July 2022

**NSW Land and Property Information**, Spatial Information eXchange (SIX) Maps - Topographic Map, accessed from <u>https://maps.six.nsw.gov.au/</u>, accessed on 22 July 2022

NSW EPA (2020) Guidelines for Consultants Reporting on Contaminated Land.

NSW EPA (1995) Sampling Design Guidelines.

NSW EPA (2014) Waste Classification Guidelines.

NSW ePlanning Spatial Viewer Portal (https://www.planningportal.nsw.gov.au/spatialviewer/)

NSW Spatial Portal - Historical Imagery (https://portal.spatial.nsw.gov.au/portal/apps/

# **APPENDIX A:**

Figures



Qualtest	
LABORATORY (NSW) PTY LTD	

Client:	EJE ARCHITECTURE PTY LTD	Drawing No:	FIGURE 1
Project:	PROPOSED AMENITIES UPGRADE	Project No:	NEW22P-0130-AA
ocation:	MAX MCMAHON OVAL, RUTHERFORD	Scale:	N.T.S
itle:	SITE LOCATION	Date:	8/08/2022



# **APPENDIX B:**

# **Analytical Results Tables**

						Field ID	BH01 0.0-0.1	BH02 0.0-0.1	BH03 0.0-0.1	BH04 0.0-0.1	BH05 0.0-0.1	BH06 0.0-0.1	BH07 0.0-0.1	BH08 0.0-0.1	BH09 0.0-0.1
						Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
	Analytes	Units	LOR	HIL/HSL C	HSL C	EIL/ESL C			-	•		-	•		
	Arsenic	mg/kg	2	300		100	5.6	2.8	6.9	4.1	13	5	8.1	5.8	6.6
	Cadmium	mg/kg	0.4	90			< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Metals PAH BTEX	Chromium	mg/kg	5	300		580*	19	12	19	11	31	21	26	37	37
Motols	Copper	mg/kg	5	17000		210*	< 5	7.3	9.6	18	< 5	9.8	13	18	8.7
IVICIAIS	Lead	mg/kg	5	600		1100	14	8.5	14	13	12	11	15	14	9.8
	Mercury	mg/kg	0.1	80			< 0.1	< 0.1	2.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Nickel	mg/kg	5	1200		170*	5.9	10	14	7.9	5.6	14	16	27	15
	Zinc	mg/kg	5	30 000		480*	21	87	140	79	37	97	75	70	39
	Acenaphthene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5				< 0.5	< 2	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 1
	Benz(a)anthracene	mg/kg	0.5				< 0.5	1	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 2
	Benzo(a)pyrene	mg/kg	0.5				< 0.5	1.1	1.4	0.6	< 0.5	< 0.5	< 0.5	2	2.6
	Benzo(a)pyrene TEQ	mg/kg	0.6	3		33	0.6	< 2	2.1	< 1	0.6	0.6	0.6	1.6	1.9
	Benzo(b&j)fluoranthene	mg/kg	0.5				< 0.5	0.7	0.7	< 0.5	< 0.5	< 0.5	0.5	1.5	2
РАН	Benzo(g.h.i)perylene	mg/kg	0.5				< 0.5	< 2	< 2	< 1	< 0.5	< 0.5	< 0.5	< 5	< 5
	Benzo(k)fluoranthene	mg/kg	0.5				< 0.5	1.3	1.3	0.6	< 0.5	< 0.5	< 0.5	2.2	2.4
	Chrysene	mg/kg	0.5				< 0.5	1.2	1.4	0.6	< 0.5	< 0.5	< 0.5	1.5	1.3
	Dibenz(a.h)anthracene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
	Fluoranthene	mg/kg	0.5				0.6	2.9	3	1	< 0.5	< 0.5	0.6	3.6	2.2
	Fluorene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5				< 0.5	0.7	0.9	< 0.5	< 0.5	< 0.5	< 0.5	1.8	2.8
	Naphthalene	mg/kg	0.5		NL	370	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5				< 0.5	< 2	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 2
PAH BTEX TRH	Pyrene	mg/kg	0.5				< 0.5	1.7	1.5	0.5	< 0.5	< 0.5	< 0.5	< 5	< 5
	Total PAH*	mg/kg	0.5	300			0.6	11	12	3.3	< 0.5	< 0.5	1.1	13	14
	Benzene	mg/kg	0.1		NL	50	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
BTEX	Ethylbenzene	mg/kg	0.1		NL	70	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
DIEX	Toluene	mg/kg	0.1		NL	85	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Metals PAH BTEX TRH Asbestos	Xylenes - Total	mg/kg	0.3		NL	105	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
	Naphthalene	mg/kg	0.5		NL	170	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	TRH C6-C10	mg/kg	20			180	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 less BTEX (F1)	mg/kg	20		NL		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH	TRH >C10-C16	mg/kg	50			120	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50		NL		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
	TRH >C16-C34	mg/kg	100			300	< 100	< 200	130	310	< 100	100	< 100	240	130
	TRH >C34-C40	mg/kg	100			2800	< 100	< 100	< 100	140	< 100	< 100	< 100	120	< 100
Asbestos	Asbestos	%w/w	0.001		Detected	b	ND								

Notes

\*

EIL based on pH of 6, CEC of 10meq/100ml, and clay content 30%.

ND Not Detected

NL Non Limiting

Result Concentration exceeds adopted human health critieria

Result Concentration exceeds adopted ecological criteria

1 ASC NEPM (2013) - Health Investigation Levels (recreational/open space)

2 ASC NEPM (2013) - Soil Health Screening Levels for Vapour Intrusion, recreational/open space, Clay 0m to <1m

3 ASC NEPM (2013) - Ecological Investigation and Screening Levels (recreational/open space)



# Table 2: Soil Analytical Results - AsbestosMax McMahon Oval, Rutherford, NSW

Sample ID	Matrix	Sample Date	ACM weight (g)	ACM weight (kg)	Soil density (kg/L)	Soil Volume (L)	Asbestos Content (%)	%w/w ACM in Soil	HSL-C	%w/w FA/AF in Soil	HSL-C
BH01 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	ND	0.001
BH02 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	-	0.001
BH03 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	-	0.001
BH04 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	ND	0.001
BH05 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	-	0.001
BH06 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	-	0.001
BH07 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	-	0.001
BH08 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	-	0.001
BH09 0.0-0.1	Soil	14/07/2022	0	0	1.8	10	15	0.000	0.02	ND	0.001

Notes:

%w/w asbestos in soil calculated using: % asbestos content x bonded ACM (kg) / soil volume (L) x soil density (kg/L)

ND = asbestos not detected

Result

Result

Criteria from ASC NEPM (2013) Table 7 - Health Screening Level (HSL) for Asbestos, High Density Residential Land Use



# Table 3: Waste Classification Analytical ResultsMax McMahon Oval, Rutherford, NSW

						Field ID	BH01 0.0-0.1	BH02 0.0-0.1	BH03 0.0-0.1	BH04 0.0-0.1	BH05 0.0-0.1	BH06 0.0-0.1	BH07 0.0-0.1	BH08 0.0-0.1	BH09 0.0-0.1
						Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
	Analytes	Units	LOR	General Solid Waste without TCLP	General Solid TC	d Waste with LP									
				CT1	SCC1	TCLP1									
	Arsenic	mg/kg	2	100			5.6	2.8	6.9	4.1	13	5	8.1	5.8	6.6
	Cadmium	mg/kg	0.4	20			< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium	mg/kg	5	100			19	12	19	11	31	21	26	37	37
Metals PAH BTEX	Copper	mg/kg	5				< 5	7.3	9.6	18	< 5	9.8	13	18	8.7
Ivietais	Lead	mg/kg	5	100			14	8.5	14	13	12	11	15	14	9.8
	Mercury	mg/kg	0.1	4			< 0.1	< 0.1	2.4	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Nickel	mg/kg	5	40			5.9	10	14	7.9	5.6	14	16	27	15
	Zinc	mg/kg	5				21	87	140	79	37	97	75	70	39
	Acenaphthene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5				< 0.5	< 2	< 1	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 1
	Benz(a)anthracene	mg/kg	0.5				< 0.5	1	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 2
	Benzo(a)pyrene	mg/kg	0.5	0.8	10		< 0.5	1.1	1.4	0.6	< 0.5	< 0.5	< 0.5	2	2.6
	Benzo(a)pyrene TCLP	mg/L	0.001			0.04	-	-	-	-	-	-	-	-	< 0.001
	Benzo(a)pyrene TEQ	mg/kg	0.6				0.6	< 2	2.1	< 1	0.6	0.6	0.6	< 5	< 5
	Benzo(b&j)fluoranthene	mg/kg	0.5				< 0.5	0.7	0.7	< 0.5	< 0.5	< 0.5	0.5	1.5	2
	Benzo(g.h.i)perylene	mg/kg	0.5				< 0.5	< 2	< 2	< 1	< 0.5	< 0.5	< 0.5	< 5	< 5
РАН	Benzo(k)fluoranthene	mg/kg	0.5				< 0.5	1.3	1.3	0.6	< 0.5	< 0.5	< 0.5	2.2	2.4
	Chrysene	mg/kg	0.5				< 0.5	1.2	1.4	0.6	< 0.5	< 0.5	< 0.5	1.5	1.3
	Dibenz(a.h)anthracene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
	Fluoranthene	mg/kg	0.5				0.6	2.9	3	1	< 0.5	< 0.5	0.6	3.6	2.2
	Fluorene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5				< 0.5	0.7	0.9	< 0.5	< 0.5	< 0.5	< 0.5	1.8	2.8
	Naphthalene	mg/kg	0.5				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5				< 0.5	< 2	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 2	< 2
	Pyrene	mg/kg	0.5				< 0.5	1.7	1.5	0.5	< 0.5	< 0.5	< 0.5	< 5	< 5
	Total PAH*	mg/kg	0.5	200			0.6	11	12	3.3	< 0.5	< 0.5	1.1	13	14
	Benzene	mg/kg	0.1	10			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
DTEV	Ethylbenzene	mg/kg	0.1	600			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
BIEX	Toluene	mg/kg	0.1	288			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3	1000			< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
	TRH C6-C9	mg/kg	20	650			< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C10-C14	mg/kg	20				< 20	< 20	< 20	< 200	< 20	< 20	< 20	< 20	< 20
TRH	TRH C15-C28	mg/kg	50				< 50	< 100	78	< 500	< 50	< 100	< 50	150	73
	TRH C29-C36	mg/kg	50				< 50	80	78	< 500	< 50	62	< 50	140	92
	TRH C10-36 (Total)	mg/kg	50	10000			< 50	< 100	156	< 500	< 50	< 100	< 50	290	165
Asbestos	Asbestos	%w/w	-		Detected		ND								

Notes:

 Value
 Result exceeds criteria for General Solid Waste without TCLP (CT1)

Value Result exceeds criteria for General Solid Waste (with TCLP)

Value Asbestos Detected

ND Not detected

Criteria from NSW EPA (2014) Waste Classification Guidelines, Tables 1 and 2

Q	ualtest
	LABORATORY (NSW) PTY LTD

	Field ID		BH01 0.0-0.1	D.14.7.22	/000	
	AnalytesArsenicCadmiumChromiumCopperLeadMercuryNickelZincAcenaphtheneAcenaphthyleneAnthraceneBenzo(a)pyreneBenzo(a)pyreneBenzo(b&j)fluorantheneBenzo(b&j)fluorantheneBenzo(b&j)fluorantheneChryseneDibenz(a.h)anthraceneFluoreneIndeno(1.2.3-cd)pyreneRapthalenePAHsBenzeneTotal PAH*BenzeneTolueneEthylbenzeneXylenes - TotalTRH C6-C9			14/07/2022	14/07/2022	KPD%
	Analytes	Units	LOR			
	Arsenic	mg/kg	2	5.6	6.6	16
	Cadmium	mg/kg	0.4	< 0.4	< 0.4	0
	Chromium	mg/kg	5	19	22	15
Motals	Copper	mg/kg	5	< 5	< 5	0
wetais	Lead	mg/kg	5	14	18	25
	Mercury	mg/kg	5	< 0.1	< 0.1	0
	Nickel	mg/kg	5	5.9	9.7	49
	Zinc	mg/kg	5	21	29	32
	Acenaphthene	mg/kg	0.5	< 0.5	< 0.5	0
	Acenaphthylene	mg/kg	0.5	< 0.5	< 0.5	0
	Anthracene	mg/kg	0.5	< 0.5	< 0.5	0
	Benz(a)anthracene	mg/kg	0.5	< 0.5	< 0.5	0
	Benzo(a)pyrene	mg/kg	0.5	< 0.5	< 0.5	0
	Benzo(a)pyrene TEQ(Medium bound)	mg/kg	0.6	0.6	0.6	0
	Benzo(b&j)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	0
	Benzo(g.h.i)perylene	mg/kg	0.5	< 0.5	< 0.5	0
ΡΔΗς	Benzo(k)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	0
PAHs	Chrysene	mg/kg	0.5	< 0.5	< 0.5	0
	Dibenz(a.h)anthracene	mg/kg	0.5	< 0.5	< 0.5	0
	Fluoranthene	mg/kg	0.5	0.6	0.6	0
	Fluorene	mg/kg	0.5	< 0.5	< 0.5	0
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5	< 0.5	< 0.5	0
	Naphthalene	mg/kg	0.5	< 0.5	< 0.5	0
	Phenanthrene	mg/kg	0.5	< 0.5	< 0.5	0
	Pyrene	mg/kg	0.5	< 0.5	< 1	Image: Replow         Image: Replow         Image: Replow         6.6       16         < 0.4
	Total PAH*	mg/kg	0.5	0.6	1	50
	Benzene	mg/kg	0.1	< 0.1	< 0.1	0
BTEX	Toluene	mg/kg	0.1	< 0.1	< 0.1	0
	Ethylbenzene	mg/kg	0.1	< 0.1	< 0.1	0
	Xylenes - Total	mg/kg	0.3	< 0.3	< 0.3	0
	TRH C6-C9	mg/kg	20	< 20	< 20	0
	TRH C10-C14	mg/kg	20	< 20	< 20	0
Ar Ga Ch Ch Cc Le M Nii Zir Ac Ac Ac Ar Be Be Be Be Be Be Be Be Be Be Be Ch Di Flu Int Na PAHs Ch Di Flu Int Na R H Tr Tr Tr Tr Tr Tr Tr Tr Tr Tr Tr Tr Tr	TRH C15-C28	mg/kg	50	< 50	< 100	0
	TRH C29-C36	mg/kg	50	50	60	18
	TRH C10-36 (Total)	mg/kg	50	< 50	< 100	0

Notes

**Bold** Relative percentage difference outside the acceptable limits (<10 X LOR = no limit, >10 X LOR = 30%).



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79	95% BCA Bootstrap UCL	206.7				1					
80	90% Chebyshev(Mean, Sd) UCL	233		95% (	Chebyshev(Me	an, Sd) UCL	267.6				
81	97.5% Chebyshev(Mean, Sd) UCL	315.5		99% (	Chebyshev(Me	an, Sd) UCL	409.8				
82						N. P. etc. (1986) for the standard states of an excision class state.					
83		Suggested	UCL to Use								
84	95% Student's-t UCL	204			oʻr 95% Mo	odified-t UCL	205.8				
85	or 95% H-UCL	219.4		T. Proceedings as a second second second second	NAMES OF A DESCRIPTION OF A DESCRIPTION						
86	ייין איז	19 J. 494 49 193 1 1 4044 44	catility in the statement of the matrice of the	antona of the second community of the property spectrum.		AND THE THE FULLERING CONTRACTOR IN THE AND AND AND					
87	Note: Suggestions regarding the selection of a 95% l	JCL are pr	ovided to hel	p the user to select	the most appr	opriate 95% l	JCL.				
88	Recommendations are base	d upon dat	ta size, data c	listribution, and ske	wness.	<ul> <li>In the submitted type descent interventional type intervention</li> </ul>	1011-1111-111-111-111-111-111-111-111-1				
89	These recommendations are based upon the results	s of the sin	nulation studie	es summarized in S	Singh, Maichle	, and Lee (200	06).				
90	However, simulations results will not cover all Real Wo	rld data se	ts; for additio	nal insight the user	may want to c	onsult a statis	stician.				
91		No			1						
92	ProUCL computes and outputs	s H-statisti	c based UCL	s for historical rea	sons only.						
93	H-statistic often results in unstable (both high and	d low) valu	ies of UCL95	as shown in exam	nples in the Te	echnical Guid	e.				
94	It is therefore recommended	I to avoid t	he use of H-	statistic based 95%	6 UCLs.						
95	Use of nonparametric methods are preferred to comp	ute UCL9	5 for skewed	data sets which d	o not follow a	gamma distri	bution.				
96											

# **APPENDIX C:**

**Desktop Searches** 

1944




























# ALL GROUNDWATER MAP

All data times are Eastern Standard Time

#### Info Map



Imagery ©2022 , CNES / Airbus, Maxar Technologies, Sinclair Knight Merz | Terms of Use | Report a map error

# WaterNSW Work Summary

#### GW202692

Licence:		L	icence Status:		
		Authoris Intend	ed Purpose(s): ed Purpose(s): MONITC	DRING BORE	
Work Type:	Bore				
Work Status:	Equipped				
Construct Method:	Auger - Solid				
Owner Type:	Private				
Commenced Date: Completion Date:	16/08/2011		Final Depth: 9.00 m Drilled Depth: 9.00 m		
Contractor Name:	Groundtruth Pty Ltd				
Driller:	Simon Carl Lott				
Assistant Driller:	Hayden Hopley				
Property:		Standi	ng Water Level		
GWMA: GW Zone:		Salini	ty Description: Yield (L/s):		
Site Details					
Site Chosen By:					
		Form A: Licensed:	<b>County</b> NORTHUMBERLAND	<b>Parish</b> GOSFO	<b>Cadastre</b> 2//517903
<b>Region</b> : 20 -	Hunter	CMA Map:	9232-4S		
River Basin: 210 Area/District:	- HUNTER RIVER	Grid Zone:		Scale:	
Elevation: 0.00 Elevation Source: Unk	nown	Northing: Easting:	6379405.000 361770.000	Latitude: Longitude:	32°42'52.1"S 151°31'30.3"E
GS Map: -		MGA Zone:	56	Coordinate Source:	GPS - Global

#### Construction

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

Hole	Pipe	Component	Туре	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	114			Auger - Solid Flight
1		Annulus	Cement	0.00	0.20	114	60		PL:Poured/Shovelled
1		Annulus	Bentonite	0.20	5.50	114	60		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	5.50	9.00	114	60		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	6.00	9.00	60		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 40.0mm, A: 0.50mm

### **Drillers Log**

From	То	Thickness	Drillers Description	Geological Material	Comments
(m)	(m)	(m)			
0.00	0.50	0.50	Silty Clay; red, dry, low plasticity	Silty Clay	
0.50	1.00	0.50	Silty Clay; brown, moist, very high plasticity	Silty Clay	
1.00	2.00	1.00	Silty Clay; dark brown	Silty Clay	

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2.00	3.50	1.50	Silty Clay; light brown	Silty Clay	
3.50	8.00	4.50	Silt, Clayey; red, dry, trace plasticity	Silt	
8.00	9.00	1.00	Silty Clay; grey, dry, high plasticity, @ 9m refusal	Silty Clay	

#### Remarks

16/08/2011: Form A Remarks:

Nat Carling, 4-Nov-2013; GPS provided by the drillers.

\*\*\* End of GW202692 \*\*\*

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

# **WaterNSW Work Summary**

#### GW202693

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Licence:		L	icence Status:		
		Authoris Intend	ed Purpose(s): ed Purpose(s): MONITC	DRING BORE	
Work Type:	Bore				
Work Status:	Equipped				
Construct Method:	Auger - Solid				
Owner Type:	Private				
Commenced Date: Completion Date:	16/08/2011		Final Depth: 7.50 m Drilled Depth: 7.50 m		
Contractor Name:	Groundtruth Pty Ltd				
Driller:	Simon Carl Lott				
Assistant Driller:	Hayden Hopley				
Property:		Standi	ng Water Level		
GWMA: GW Zone:		Salini	ty Description: Yield (L/s):		
Site Details					
Site Chosen By:					
		Form A: Licensed:	<b>County</b> NORTHUMBERLAND	<b>Parish</b> GOSFO	<b>Cadastre</b> 2//517903
<b>Region</b> : 20 -	Hunter	СМА Мар:	9232-4S		
<b>River Basin:</b> 210 <b>Area/District:</b>	- HUNTER RIVER	Grid Zone:		Scale:	
Elevation: 0.00 Elevation Source: Unk	m (A.H.D.) nown	Northing: Easting:	6379408.000 361767.000	Latitude: Longitude:	32°42'52.0"S 151°31'30.1"E
GS Map: -		MGA Zone:	56	Coordinate Source:	GPS - Global

#### Construction

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

Hole	Pipe	Component	Туре	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.50	114			Auger - Solid Flight
1		Annulus	Cement	0.00	0.20	114	60		PL:Poured/Shovelled
1		Annulus	Bentonite	0.20	4.00	114	60		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	4.00	7.50	114	60		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	4.50	60	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	4.50	7.50	60		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 40.0mm, A: 0.50mm

#### **Drillers Log**

From	То	Thickness	Drillers Description	Geological Material	Comments
(m)	(m)	(m)			
0.00	1.00	1.00	Silt, Clayey; brown, dry, trace plasticity, @ 1m	Silt	
			trace gravel		
1.00	7.50	6.50	Silty Clay; brown, dry, high plasticity, @ 3m	Silty Clay	

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	brown-grey, @ 4.5m grey, mottled red, @ 5m grey, @ 6.5m brown, @ 7.5m refu
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#### Remarks

16/08/2011: Form A Remarks: Nat Carling, 4-Nov-2013; GPS provided by the drillers.

\*\*\* End of GW202693 \*\*\*

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

# **WaterNSW Work Summary**

#### GW202694

Licence:		L	icence Status:		
		Authoris Intend	ed Purpose(s): ed Purpose(s): MONITC	DRING BORE	
Work Type:	Bore				
Work Status:	Equipped				
Construct Method:	Auger - Solid				
Owner Type:	Private				
Commenced Date: Completion Date:	16/08/2011		Final Depth: 7.45 m Drilled Depth: 6.50 m		
Contractor Name:	Groundtruth Pty Ltd				
Driller:	Simon Carl Lott				
Assistant Driller:	Hayden Hopley				
Property:		Standi	ng Water Level		
GWMA: GW Zone:		Salini	ty Description: Yield (L/s):		
Site Details					
Site Chosen By:					
		Form A: Licensed:	<b>County</b> NORTHUMBERLAND	<b>Parish</b> GOSFO	<b>Cadastre</b> 1//517903
<b>Region</b> : 20 -	Hunter	CMA Map:	9232-4S		
<b>River Basin</b> : 210 <b>Area/District</b> :	- HUNTER RIVER	Grid Zone:		Scale:	
Elevation: 0.00 Elevation Source: Unk	m (A.H.D.) nown	Northing: Easting:	6379372.000 361764.000	Latitude: Longitude:	32°42'53.1"S 151°31'30.0"E
GS Map: -		MGA Zone:	56	Coordinate Source:	GPS - Global

#### Construction

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

Hole	Pipe	Component	Туре	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.45	114			Auger - Solid Flight
1		Annulus	Cement	0.00	0.20	114	60		PL:Poured/Shovelled
1		Annulus	Bentonite	0.20	4.00	114	60		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	4.00	7.45	114	60		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	4.45	60	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	4.45	7.45	60		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 40.0mm, A: 0.50mm

#### **Drillers Log**

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	Silty Clay; grey mottled red, dry, very high plasticity	Silty Clay	
0.50	2.50	2.00	Silt, Sandy; trace sand, red, dry, low plasticity	Silt	

7/22/22, 2:09 PM

2.50 6.50	4.00	Silt, Clayey; red, dry, medium plasticity, @ 7m brown, @ 7.45m refusal	Silt		
-----------	------	---	------	--	--

#### Remarks

16/08/2011: Form A Remarks: Nat Carling, 4-Nov-2013; GPS provided by the drillers.

\*\*\* End of GW202694 \*\*\*

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

# WaterNSW Work Summary

#### GW203443

Licence:	20CA217091	Licence Status:	CURRENT
		Authorised Purpose(s): Intended Purpose(s):	IRRIGATION,STOCK STOCK, IRRIGATION
Work Type:	Bore		
Work Status:	Supply Obtained		
Construct.Method:	Down Hole Hamm		
Owner Type:	School		
Commenced Date: Completion Date:	01/06/2015	Final Depth: Drilled Depth:	90.00 m 90.00 m
Contractor Name:	Ace drilling		
Driller:	David Mayled		
Assistant Driller:			
Property:	RUTHERFORD TECHNOLOGY HIGH AVERY STREET RUTHERFORD 2320	Standing Water Level (m):	
GWMA:	-	Salinity Description:	
GW Zone:	-	Yield (L/s):	3.125
Site Details			
Site Chosen By:			

	County Form A: NORTHUMBERLA Licensed: NORTHUMBERLA	ParishCadastreNDGOSFO1//712760NDGOSFORTHWhole Lot 1//712760
Region: 20 - Hunter	CMA Map: 9232-4S	
River Basin: 210 - HUNTER RIVER Area/District:	Grid Zone:	Scale:
Elevation: 0.00 m (A.H.D.) Elevation Source: Unknown	Northing: 6379795.000 Easting: 362196.000	Latitude: 32°42'39.6"S Longitude: 151°31'46.8"E
GS Map: -	<b>MGA Zone:</b> 56	Coordinate Source: Unknown

#### Construction

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

Hole	Pipe	Component	Туре	From	То	Outside	Inside	Interval	Details
				(m)	(m)	Diameter	Diameter		
<u> </u>		ļ				(mm)	(mm)		
1		Hole	Hole	0.00	7.00	220			Down Hole Hammer
1		Hole	Hole	7.00	90.00	203			Down Hole Hammer
1	1	Casing	Pvc Class 9	0.00	90.00	150	132		Seated on Bottom, Riveted and Glued, S: 84.00-
]									90.00m
1	1	Casing	Galvinised Steel	0.00	7.00	220	208		
1	1	Opening	Slots - Vertical	60.00	84.00	150		0	Casing - Hand Sawn Slot, PVC Class 9, Riveted
									and Glued, SL: 130.0mm, A: 2.00mm

### Water Bearing Zones

	From (m)	To (m)	Thickness (m)	WBZ Туре	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
	60.00	61.00	1.00	Unknown			0.63			
- 0										

7/22/22, 2:07 PM https://realtimedata.waternsw.com.au/wgen/users/cbb55dc0491b44bb87de6b0bd242c991/gw203443.agagpf\_org.wsr.htm?16584...

65.00 67.00 2.00 Unknown 2.50 2.50
------------------------------------

### Drillers Log

From	То	Thickness	Drillers Description	s Description Geological Material C			
(m)	(m)	(m)					
0.00	1.00	1.00	Topsoil; dark	Topsoil			
1.00	3.00	2.00	Loam	Loam			
3.00	7.00	4.00	Clay; red	Clay			
7.00	90.00	83.00	Sandstone; light grey	Sandstone			

#### Remarks

01/06/2015: Nat Carling, 15-Sept-2015; No location was provided, based in the centre of the authorised land. Map sent to owner for true location. Adjusted hole diameter to fit casing protector.

#### \*\*\* End of GW203443 \*\*\*

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

# **APPENDIX D:**

Logs

![](_page_50_Picture_0.jpeg)

PROJECT: PROPOSED SPORTS AMENITIES BUILDING

LOCATION: MAX MCMAHON OVAL, RUTHERFORD

CLIENT:

BOREHOLE NO:

MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

.

NEW22P-0130

Job No: Logged by:

DATE:

BS 14/7/22

	DR BO	ILL T	YPE: OLE DIAN	2.7 IETEF		E EXCAVATOR SURFACE RL: 300 mm DATUM:								
ŀ		Drill	ing and San	nplina				Material description and profile information				Fiel	d Test	
-	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	Е		E 0.10m 0.40m E 0.50m		- - - - -		Сн Сі Сі	FILL-TOPSOIL: Sandy CLAY - medium to h plasticity, brown, fine to medium grained sa 0.10m affected. FILL: Sandy CLAY - medium plasticity, brow medium grained. 0.40m Sandy CLAY - medium plasticity, brown to orange-brown, fine grained sand.	nigh nd, root	M > Wp	VSt	HP	320	FILL - TOPSOIL
					-			0.80m				ΗP	300	
	LEG Wat Stra	SEND: er Wat (Dat Uat Wat I Wat	er Level e and time sl er Inflow er Outflow anges radational or	nown)	1.0 1.0 - - - 1.5 - - - - - - - - - - - - -	mples au 50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S	nd Tes Diame ample i jar, se c bag, ample	Hole Terminated at 0.80 m Limit Of Required Investigation	ConsisteVSVSSFFStSVStVHFFbFDensity	ncy /ery Soft Soft fard friable V		Uu <2 50 100 20 22 24	CS (kPa 25 5 - 50 0 - 100 00 - 200 00 - 400 400	<b>b)</b> Moisture Condition D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit Density Index <15% Density Index <15%
	Gradational or transitional strata Definitive or distict strata change     Field Test PID DCP(x-y) HP					Photoi Dynan Hand I	onisati nic pen Penetro	on detector reading (ppm) etrometer test (test depth interval shown) ometer test (UCS kPa)			Lo D D U	ediun ense erv D	n Dense ense	Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100

**BH01** 1 OF 1

![](_page_51_Picture_0.jpeg)

PROJECT: PROPOSED SPORTS AMENITIES BUILDING

LOCATION: MAX MCMAHON OVAL, RUTHERFORD

CLIENT:

BOREHOLE NO:

MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

**BH02** 1 OF 1

NEW22P-0130

Job No: Logged by:

DATE:

BS 14/7/22

D	RILL 1 OREH	IYPE: OLE DIAN	2.7 IETEI	TONNE	EXCA 300 m	CAVATOR SURFACE RL: ) mm DATUM:							
	Dril	ling and Sar	nplina				Material description and profile information				Fiel	d Test	
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
		E 0.10m				SP	FILL-TOPSOIL: SAND - fine to medium gra brown, with some fines of low plasticity. <u>0.10m</u> FILL: Clayey SAND - fine to medium graine fines of low plasticity.	ained, dark  ed, brown,	- M				FILL - TOPSOIL
ш		E 0.40m		0. <u>5</u>		СН	CLAY - medium to high plasticity, brown to brown with some pale red-brown.		M > Wp	St - VSt	HP	190 240	RESIDUAL SOIL
						CI	Sandy CLAY - medium plasticity, pale brow pale red-brown, fine grained sand, with son	<i>r</i> n and ne silt.	M < w <sub>p</sub>	VSt	HP	380	
	iGEND: ater Z Waa	ter Level		1.0 1.0 1.5 1.5 U <sub>50</sub> CBR E	- - - - - - - - - - - - - - - - - - -	nd Tes n Diame	Hole Terminated at 0.80 m Limit Of Required Investigation	Consiste VS V F F	Incy /ery Soft Soft Firm		U <25 50	<b>CS (kP2</b> 25 5 - 50 0 - 100	<ul> <li>Moisture Condition D Dry M Moist W Wet</li> </ul>
▶	▶     Water Inflow     ASS     Acid 5       ✓     Water Outflow     (Plast       Strata Changes     B     Bulk 5        Gradational or transitional strata     Field Tests        Definitive or distict     DCP(x-y)     Dynar				Acid S (Plast Bulk S ts Photo Dynar	Sulfate S ic bag, Sample ionisationisation	ioil Sample ir expelled, chilled) on detector reading (ppm) etrometer test (test depth interval shown)	VSt V H H Fb F Density	/ery Stiff Hard Friable V L ME	V La	20 >2 ery Lo bose lediun	00 - 400 400 pose n Dense	WL     Liquid Limit       Density Index <15%
	st	trata change		HP	Hand	Penetro	meler lest (UCS KPa)			D V	ense ery D	ense	Density Index 65 - 85% Density Index 85 - 100%

![](_page_52_Picture_0.jpeg)

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

PROJECT: PROPOSED SPORTS AMENITIES BUILDING

LOCATION: MAX MCMAHON OVAL, RUTHERFORD

**BH03** 

JOB NO: LOGGED BY:

DATE:

BB 14/7/22

	DR BO	LL T REH	YPE: OLE DIAN	2.7 IETEF	TONNE R:	INE EXCAVATOR SURFACE RL: 300 mm DATUM:								
F		Drill	ing and Sar	npling				Material description and profile information				Fiel	d Test	
	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
			E 0.10m 0.40m		-		CL 	FILL-TOPSOIL: Sandy CLAY - low to media plasticity, dark grey-brown, fine to medium sand, trace fine grained angular gravel, roo <u>0.20m</u> FILL: Sandy CLAY - medium plasticity, pale fine to coarse grained sand, with some fine medium grained angular gravel.	um grained t affected.	-				
	ш		E 0.50m U50 0.70m		0. <u>5</u> -		СН	CLAY - medium to high plasticity, red-brown pale grey and pale grey-brown, with some f medium grained sand.	n, trace ine to	M > wp	VSt	HP HP	230 300	RESIDUAL SUIL
					- 1. <u>0</u>		CI	Sandy CLAY - medium plasticity, pale brow orange-brown and pale grey-brown, with sc red-brown, fine to medium grained sand.	n to pale me			HP	320 250	
10.007 10.007 10.007 Dauger					-		SC	Clayey SAND - tine grained, pale orange-bi pale grey-brown, fines of low plasticity. 1_20m Silty SANDSTONE - fine grained, pale grey orange-brown, estimated low strength.	rown and  r and pale	M D	D - VD			RESIDUAL SOIL/ EXTREMELY WEATHERED ROCK HIGHLY WEATHERED ROCK
	LEG	END:			1.5	- -	nd Tes	Hole Terminated at 1.45 m Practical Refusal	Consister	ncy		U	CS (kP≉	a) Moisture Condition
מן בום ו.ווטבם בטט ואטוד-טטויבע מטויבווטבב	LEGEND: Notes, S: Water Usel (Date and time shown) ► Water Inflow ASS Water Outflow Strata Changes CBR E B Field Tes PID Definitive or distict strata change				Notes, Sa U₅₀ CBR E ASS B Field Tesi PID DCP(x-y) HP	mples a 50mm Bulk s Envirc (Glass Acid S (Plasti Bulk S Bulk S Photo Dynar Hand	nd Tes Diame ample onmenta s jar, se Sulfate S ic bag, Sample ionisationis to penetro	<ul> <li><u>s</u>         er tube sample         or CBR testing         I sample         Isample         iled and chilled on site)         oil Sample         ir expelled, chilled)         n detector reading (ppm)         trometer test (test depth interval shown)         meter test (UCS kPa)</li> </ul>	Consister       VS     V       S     S       F     F       St     S       VSt     V       H     H       Fb     F       Density	ncy ery Soft oft tiff ery Stiff lard riable V L ME D VD	Vi La D M	U <2 25 50 10 20 20 20 20 20 20 20 20 20 20 20 20 20	US (KPa 25 5 - 50 ) - 100 )0 - 200 )00 - 200 )00 - 400 400 pose n Dense ense	Moisture Condition           D         Dry           M         Moist           W         Wet           Wp,         Plastic Limit           WL         Liquid Limit           Density Index <15%           Density Index <15 - 35%           Density Index 35 - 65%           Density Index 85 - 85%           Density Index 85 - 100%

1 OF 1 NEW22P-0130

![](_page_53_Picture_0.jpeg)

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

**PROJECT:**PROPOSED SPORTS AMENITIES BUILDING**JOB NO:LOCATION:**MAX MCMAHON OVAL, RUTHERFORD**LOGGED** 

0:

LOGGED BY: DATE: BB 14/7/22

**BH04** 

1 OF 1

NEW22P-0130

	DR BO	ILL T REH	YPE: OLE DIAN	2.7 <b>1ete</b> f	TONNE	EXCA 300 m	VATO	SURFACE RL: DATUM:						
ŀ		Drill	ling and Sar	nplina				Material description and profile information				Fiel	d Test	
	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle is	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	Е		E 0.10m 0.40m E 0.50m		- - - 0. <u>5</u>		SC  СI 	FILL-TOPSOIL: Silty SAND - fine to medium dark grey-brown, fines of low plasticity, root 	n grained, affected. b pale ned sand, e roots. n, with n grained	M M	VSt	HP	300	FILL - TOPSOIL
		END: er Wat (Dai Wat ta Chi	ter Level te and time s ter Inflow ter Outflow anges	hown)	1.0 1.0 1.5 1.5 0 0 0 0 0 0 0 0 0 0 0 0 0	mples a 50mm Bulk s Enviso (Glass Acid S (Plast Bulk 5	Ind Tess manple Sample Sample	0.60m Hole Terminated at 0.60 m Limit Of Required Investigation           Image: State of the state of	Consiste VS V S S F S VSt V H H F Doncit	ncy fery Soft Soft ard iriable		<u>U</u> <2 25 50 10 20 20	CS (kPa 25 5 - 50 0 - 2000 0 - 2000 0 - 2000	a) <u>Moisture Condition</u> D Dry M Moist W Wet W <sub>L</sub> Plastic Limit W <sub>L</sub> Liquid Limit
	Gradational or transitional strata     Field Tests       Definitive or distict strata change     PID     Pho       HP     Har			Photo Dynar Hand	ionisati nic pen Penetro	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)		L ME D VD	La D M D D	ediun ediun ense ery Do	n Dense ense	Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%		

![](_page_54_Picture_0.jpeg)

### **ENGINEERING LOG - BOREHOLE**

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

PROJECT: PROPOSED SPORTS AMENITIES BUILDING LOCATION: MAX MCMAHON OVAL, RUTHERFORD

JOB NO: LOGGED BY: DATE:

BB 14/7/22

	DRILL TYPE:2.7 TONNE EXCAVATORBOREHOLE DIAMETER:300 mm							R SURF						
F		Dril	ling and San	npling				Material description and profile information				Fiel	d Test	
	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	E		E 0.10m 0.40m U50 0.55m		- - - 0. <u>5</u>		СН 	CLAY - medium to high plasticity, pale brow orange-brown, with some pale grey, with so to medium grained sand. 0.20m	vn to pale ome fine  le brown	M > Wp	VSt	HP	280 250	RESIDUAL SOIL
b and In Situ Tool					- 1. <u>0</u>		SC	Extremely weathered Silty Sandstone with properties: breaks down into Clayey SAND medium grained, pale brown to pale orange fines of low plasticity.	soil - fine to e-brown, 	M	VD			EXTREMELY WEATHERED ROCK / RESIDUAL SOIL HIGHLY WEATHERED ROCK
Log_NON-CORED BOREHOLE - TEST PIT_NEW22P-0130 LOGS.GPJ_< <drawingfile>&gt;_29/07/2022 13:43_10.02.00.04_Datgel L</drawingfile>	LEG Watu	END: er (Da Wat Wat	ter Level te and time si ter Inflow ter Outflow anges	hown)		mples a 50mm Bulk s Enviro (Glass Acid S (Plast Bulk S	nd Tes Diame ample 1 Sufrate S Cic bag, i Sample	<u>s</u>	Consister VS V S S F St St S VSt V H H Fbereity	ncy ery Soft tiff tiff ery Stiff ard		U <2 50 10 20 20	CS (kPa 55 5-50 0-100 00 - 2000 100 100	1) <u>Moisture Condition</u> D Dry M Moist W Wet W <sub>p</sub> Plastic Limit W <sub>L</sub> Liquid Limit
QT LIB 1.1.GLB LI	Gradational or transitional strata Definitive or distict strata change				Field Test PID DCP(x-y) HP	t <u>s</u> Photo Dynar Hand	ionisatio nic pen Penetro	on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	<u>Density</u>	V L ME D VD	V La D D	ery Lo bose lediun ense ery Di	oose n Dense ense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%

**BH05** 

NEW22P-0130

1 OF 1

![](_page_55_Picture_0.jpeg)

### **ENGINEERING LOG - BOREHOLE**

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

PROJECT: PROPOSED SPORTS AMENITIES BUILDING

LOCATION: MAX MCMAHON OVAL, RUTHERFORD

JOB NO:

DATE:

1 OF 1 NEW22P-0130

**BH06** 

LOGGED BY:

BS 14/7/22

	DRILL TYPE:2.7 TONNE EXCAVATORBOREHOLE DIAMETER:300 mm				TONNE :	EXCA 300 m	VATC m	DR SURF, DATU	SURFACE RL: DATUM:					
ľ	Drilling and Sampling							Material description and profile information	Material description and profile information			Fiel	d Test	
-	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component:	//particle s	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	Ш		E 0.10m 0.40m E 0.50m		- - 0. <u>5</u>		сн сі	FILL-TOPSOIL: Sandy CLAY - medium to h plasticity, brown and pale brown, with some brown, with some fine grained, sub-angular root affected to 0.1m.	igh dark gravel, rown and	M > W	VSt			FILL RESIDUAL SOIL
og NON-CORED BOREHOLE - TEST PIT NEW22P-0130 LOGS GPJ ≪DrawingFile>> 29/07/2022 13:43 10:02.00.04 Datgel Lab and In Slu Tool	LEG Wat Stra	END: er (Da Wa' Wa' ta Ch	ter Level te and time si ter Inflow ter Outflow anges	hown)	Notes, Sa U <sub>50</sub> CBR E ASS B	mples a 50mm Bulk s Envirc (Glass Acid S (Plasti Bulk S	nd Tesi Diame ample f nmenta ; jar, sea c bag, a ample	0.60m       SANDSTONE - fine grained, brown.         Hole Terminated at 0.60 m       Limit Of Required Investigation         Limit Of Required Investigation       State         ter tube sample       State         ter tube sample       State         al sample       aled and chilled on site)         Soil Sample       State         air expelled, chilled)       State	Consister VS V S S F Fi St S VSt V H H Fb Fi	D D P P P P P P P P P P P P P		Uu <2 25 50 100 20 2/2	CS (kPa 25 5-50 0-100 00-200 100 00-400	Moisture Condition         SANDSTONE
QT LIB 1.1.GLB 1	Gradational or transitional strata Definitive or distict strata change			on detector reading (ppm) etrometer test (test depth interval shown) ometer test (UCS kPa)	Density         V         Very Loose         D           L         Loose         D           MD         Medium Dense         D           D         Dense         D           VD         Very Dense         D		Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%							

![](_page_56_Picture_0.jpeg)

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

PROJECT: PROPOSED SPORTS AMENITIES BUILDING

LOCATION: MAX MCMAHON OVAL, RUTHERFORD

JOB NO:

DATE:

1 OF 1 NEW22P-0130

LOGGED BY:

BB 14/7/22

**BH07** 

	DRILL TYPE:2.7 TONNE EXCAVATORSURBOREHOLE DIAMETER:300 mmDAT							ACE RL: IM:						
F	[	Drilli	ng and San	npling				Material description and profile information				Field	d Test	
		WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity characteristics,colour,minor component	y/particle is	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
			E 0.10m		-		CL	FILL-TOPSOIL: Sandy CLAY - low to mediu plasticity, grey-brown to dark grey-brown, fir grained sand, root affected. Pale grey-brown to grey-brown.	um ne	M > W <sub>P</sub>				FILL - TOPSOIL
ŀ	ш		0.40m		_		СН	FILL: CLAY - medium to high plasticity, dark trace fine grained sand.	k grey,					FILL
			E 0.50m		0.5		сі	Gravelly Sandy CLAY - medium plasticity, p and pale grey-brown, fine to medium graine <u>0.50m</u> fine grained) sand, fine to coarse grained (n	ale brown ed (mostly mostly fine	≥ 8	VSt / Fb			RESIDUAL SOIL / EXTREMELY WEATHERED ROCK
					-			SANDY SILTSTONE - fine grained, pale brown, estimated very low streng SILTY SANDSTONE - fine grained, pale brown, estimated very low streng SILTY SANDSTONE - fine grained, pale brown pale orange-brown with some pale grey, es 0.70m, low to medium strength.	] own to th own to timated	- D				HIGHLY WEATHERED ROCK
.E - TEST PIT NEW22P-0130 LOGS.GPJ < <drawingfile>&gt; 2907/2022 13:43 10.02.00.04 Datgel Lab and in Situ Tool</drawingfile>	EGEN	ND:			- 1.0_ - - 1.5_ - - - - - - - - - - - - - - - - - - -	mples a	nd Test	Lestmated medium strength. Hole Terminated at 0.70 m Practical Refusal	Consiste				CS (kPa	Moisture Condition
og NON-CORED BOREHO	Vater V ( V V V V V Strata	Wate (Date Wate Wate <b>Cha</b>	er Level e and time sh er Inflow er Outflow <b>Inges</b>	nown)	U <sub>50</sub> CBR E ASS B	50mm Bulk s Enviro (Glass Acid S (Plasti Bulk S	Diame ample f nmenta jar, sea ulfate S c bag, a ample	ter tube sample or CBR testing I sample aled and chilled on site) ioil Sample sir expelled, chilled)	VS V S S F F St S VSt V H H Fb F	VS Very Soft S Soft F Firm St Stiff VSt Very Stiff H Hard		<2 25 50 10 20 >4	25 - 50 0 - 100 10 - 200 10 - 400 100	D         Dry           M         Moist           W         Wet           W <sub>p</sub> Plastic Limit           W <sub>L</sub> Liquid Limit
QT LIB 1.1.GLB Lo	Strata Changes     Difference       Gradational or transitional strata     Field Tests       Definitive or distict strata change     DCP(x-y)       Dynamic penetrometer test (I				n detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density V Very L Loos MD Med D Den VD Very		ery Lo bose ledium ense ery De	n Dense ense	Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%				

![](_page_57_Picture_0.jpeg)

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

PROJECT: PROPOSED SPORTS AMENITIES BUILDING LOCATION: MAX MCMAHON OVAL, RUTHERFORD

JOB NO: LOGGED BY: DATE:

BB 14/7/22

**BH08** 

1 OF 1

NEW22P-0130

	DRILL TYPE:2.7 TONNE EXC/BOREHOLE DIAMETER:300 m			EXCA 300 m	VATC m	TOR SURFACE RL: DATUM:								
		Drill	ing and San	npling				Material description and profile information				Fiel	d Test	
	METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticit characteristics,colour,minor componen	y/particle ts	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
	Е		E 0.10m 0.30m		-		CL	FILL-TOPSOIL: Sandy CLAY - low to medii plasticity, grey-brown, fine to medium grain trace fine to medium grained angular grave asphalt and glass.	um ed sand, el, trace to white, n fine to	> Wp		-		FILL / TOPSOIL
			E 0.40m		0. <u>5</u>		СІ	Pale grey-white.		Σ	VSt	HP	300	
Log NON-CORED BOREHOLE - TEST PIT NEW22P-0130 LOGS/GPJ < <drawingfile>&gt; 29/07/2022 13:43 10.02.00 04 Datgel Lab and In Situ Tool</drawingfile>	LEC Wat Stra	END: er (Dat ∪Wat UWat	er Level te and time sl er Inflow er Outflow <b>anges</b>	hown)		mples a 50mm Bulk s Envirc (Glass Acid S (Plasti S	nd Tes: Diame ample f nmenta ; jar, se ulfate S c bag, a ;ample	Hole Terminated at 0.60 m Limit Of Required Investigation	Consister VS VG S SG F Fi St SI VSt VG H H: Fb Fr Fb Fr	ECY Fry Soft fr ard iable V		U U<22551020>2ery Lc	CS (kP2 25 5-50 - 100 00 - 200 00 - 400 000	) Moisture Condition D Dry M Moist W Wet Wp, Plastic Limit WL Liquid Limit Density Index <15%
2T LIB 1.1.GLB 1	Gradational or transitional strata     Definitive or distict strata change     Strata     Gradational or     transitional strata     Definitive or distict     Strata change     Strata c				on detector reading (ppm) etrometer test (test depth interval shown) meter test (UCS kPa)	Density	uensity         v         Very Loose         Density Index <1'			Density Index <15% Density Index 15 - 35% Density Index 35 - 65% Density Index 65 - 85% Density Index 85 - 100%				

![](_page_58_Picture_0.jpeg)

### **ENGINEERING LOG - BOREHOLE**

BOREHOLE NO:

CLIENT: MAITLAND CITY COUNCIL C/ EJE ARCHITECTURE PAGE:

PROJECT: PROPOSED SPORTS AMENITIES BUILDING

LOCATION: MAX MCMAHON OVAL, RUTHERFORD

JOB NO:

1 OF 1 NEW22P-0130

LOGGED BY:

DATE:

BB 14/7/22

**BH09** 

	DRILL TYPE: 2.7 TONNE EXCAVATOR				OR											
+	Drilling and Sampling				Material description and profile information				Field	d Tost						
	QO			CATION			Inarticle	URE TION	IENCY ITY	-jpe	Tesi	Structure and additional				
	METH	WAT	SAMPLES	(m)	(m)	GRAF	CLASSIFI SYME		characteristics,colour,minor components		nts CONCIS CONCI		Test 1	Res	observations	
			E 0.10m		-				FILL-TOPSOIL: Clayey SAND - fine to med grained, brown, fines of low plasticity, with s to medium grained rounded to sub-rounded root affected.	ium ome fine I gravel,					FILL / TOPSOIL	
				SC SC	0.30	m		M								
	ш		-				Gravelly Sandy CLAY - low to medium plas brown to brown, fine to coarse grained sand medium grained, angular to sub-angular gra asphalt.	ticity, pale d, fine to avel, trace	e				FILL			
			0.50m E 0.60m		0.5		CL				M > W					
		0.70m			0.70	70mSandy CLAY - low to medium plasticity, pale		- Å	St / Fb			RESIDUAL SOIL /				
			∟ <u>0.80m</u>					0.80	angular to sub-angular gravel. Grading into Extremely Weathered rock. (S Silistone)	andy	∫ ∑				ROCK	
itu Tool					1.0				Limit Of Required Investigation							
tgel Lab and In S					-											
10.02.00.04 Da					-											
29/07/2022 13:43					-											
<drawingfile>&gt;</drawingfile>					1. <u>5</u>											
30 LOGS.GPJ <					-											
ST PIT NEW22P-0					-											
E - TES	LEG				Notes Sa	mples a	nd Tee			Consie	tency			CS (kPa	Moisture Condition	
<b>KEHOLE</b>	Wate	er er				50mm	Diame	eter tu	ube sample	VS	Very Sof	ť	<2	25	D Dry	
D BOR	Ţ	Wat	er Level	hours	E	Bulk s Envirc	ample f nmenta	ror C al sa	ык lesting mple	F	Soft Firm		25 50	5 - 50 ) - 100	W Wet	
COREL	(Date and time shown) Water Inflow Water Inflow ASS Acid Sulfate Soil Same				and chilled on site) Sample	St VSt	Stiff Very Stif	f	10 20	)0 - 200 )0 - 400	W <sub>p</sub> Plastic Limit W <sub>1</sub> Liquid Limit					
NON	<b></b>	Wat	er Outflow		в	(Plasti	c bag, a	air ex	xpelled, chilled)	H	Hard		>2	400		
B Log	Strata Changes         B         Bulk Sample           Gradational or         Field Tests         Field Tests				<i></i> .	Density	<u>v</u> V	Ve	ery Lo	ose	Density Index <15%					
1.1.GL		tra D	ansitional stra efinitive or dis	ata stict	PID DCP(x-y)	Photoi Dynan	ionisatio nic pen	on de netror	etector reading (ppm) neter test (test depth interval shown)		L	Lo D M	oose ediun	n Dense	Density Index 15 - 35% Density Index 35 - 65%	
Strata change HP Hand Penetrometer test (UCS kPa)					er test (UCS kPa)		D VI	De DVe	ense ery Do	ense	Density Index 65 - 85% Density Index 85 - 100%					

# **APPENDIX E:**

**Data Validation Report** 

#### QA/QC DATA VALIDATION REPORT Job No: NEW22P-0130-AA

#### Eurofins report: 906021-S, 906021-S-V2, 906021-AID, 906021-AID-V2, 911479-L

#### 1. SAMPLE HANDLING

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

#### Sampling Handling was:

Satisfactory : √	Partially Satisfactory:	Unsatisfactory:

#### 2. PRECISION AND ACCURACY ASSESSMENT

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

#### Laboratory Precision and Accuracy was:

Satisfactory :	/	Partially Satisfactory:	Unsatisfactory:
••••••			

### 3. FIELD QA/QC

#### Soil Samples

	Samples
No. Samples Analysed	9
No. of Duplicates	1
No. of Triplicates	0
No. of Wash Blanks	0
No. of Trip Blanks	0
No. of Trip Spikes	0

### No. Days Sampling

Item	Days
Number of Days Sampling	1
Number of Sampling Events	1

#### **Field Duplicates**

Item	Yes/No	Comments
Were an adequate		Duplicates analysed at a rate of 1 per 9 samples.
number of field	Yes	
duplicates analysed?		
Were RPDs within		
control limits?	Vaa	-
No Limit for 5-10 x EQL	res	
and 30% for >10 x EQL		

#### Trip Blanks/Trip Spikes

ltem	Yes/No	Comments
Were an adequate number of trip blanks and trip spikes collected?	Yes	No trip blanks or trip spikes were collected. Based on field observations (no odours or staining was observed), the absence of a trip spike does not affect the data usability.
Were the trip blanks free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals).	N/A	-
Were the trip spikes within recovery limits (between 80% and 120%)	N/A	-

#### **Rinsate Samples**

Item	Yes/No	Comments
Were an adequate number of rinsate		No rinsate samples were collected as
samples used? (1 per day of using	Voc	no reusable sampling equipment
reusable sampling equipment – trowel,	162	was used. Samples were collected
hand auger etc)		with the aid of an excavator.

Were the rinsate samples free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals).	N/A	-
--	-----	---

#### 4. LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

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

Item	Yes/No	Comments
<b>B)</b> Were the laboratory blanks and/or reagent blanks free of contamination?	Yes	-
C) Were the spike recoveries within control limits? I: Organics/inorganics/metals (50% to 150%) II: Phenols (20% to 130%)	Yes	_
D) Were the RPDs of the laboratory duplicates within control limits?	Yes	-
E) Were the surrogate recoveries within control limits?	Yes	-

#### Laboratory Internal QA/QC was:

Satisfactory :	$\checkmark$	Partially Satisfactory:	Unsatisfactory:

#### DATA USABILITY

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

# **APPENDIX F:**

Laboratory Results

	Eurofins   Environment Tes	ting ABN 50 005 085 521		02 9900 840	0 Energiamplate	F Millinumbro. com	07/193	2.4500 EnviroSamphiCEC	dewatina.som	> 08 52 61 5500 ° 64	winiSampleWAQ	inundinu d	There	-		CE 850	4.5000 EnviroSampleV	Burofos com
Company	Qualtest		Projec	it Ne	NEW22P-013	30		Project Manager	Emma Colen	an		Sa	mp)er(a	3	Billy	Snow		
Address	2 Murray Duwor Circu	uit Maufiald Wast NSW 2204	Project	Name	MCC - Ruthe	erford *		EDD Format EStat, FOx/3 etc.	Excel			Hand	ed ove	by				
Addresa	2 Murray Dwyer Circl	uit mayneid west NSW 2504	12									Email	for Inv	oice	acc	ounts	@qualtest.con	1.au
Contact Name	Emma Coleman		olat" er "Fi									Email	ic: Res	ults	libbyb emma	etz@qua coleman	ltest.com.au billysnow@ @qualtest.com.au step!	)qualtest.com.au acullen@qualtest.com.au
Phone Na			is Ather SU	Metals								Gha	inge oorl	Contair airer type	10 <b>15</b> 6 nao fing	001551Y	Required To Default of	rmaround Time (TA) I be 5 asys if not licked
pecial Directions			Analyse are requested phone code misiter used to	TRH, BTEX, PAHs,	(sbestos (%w/w)							tic	te te	Glass	rial Bottle	IDPE)	Same day       □     2 days ◆	• Sectors and approximation (reporting by 9am) • • 1 day • 3 days •
Ouote ID Ne	180622QUAN-3		White meta	Suite B7 -	4							500mL Plas	125mL Plas	)mL Amber	40mL VOA	(Glass or h	965555 5 days (St	andard)
	Client Sample ID	Sampled Date/Time ddhywyy Norm	Matrix Solit (3) Woler (W)											500	20.1	Jar	Sam J Dangerous	ple Comments Goods Hazard Wami
	BH01 0.0-0.1	14/07/22	Soil	X	×											1	1	
	BH01 0.4-0.5	14/07/22	Soil			-										1		
	BH02 0.0-0.1	14/07/22	Soil	X	x											1	1	
	BH02 0.3-0.4	14/07/22	Soil													1		
2	BH03 0.0-0.1	14/07/22	Soil	×	x						J					1	1	
	BH03 0.4-0.5	14/07/22	Soil													1		
	BH04 0.0-0.1	14/07/22	Soil	x	X			1								1	1	
	BH04 0.4-0.5	14/07/22	Soil													1		
	BH05 0.0-0.1	14/07/22	Soil	x	X											1	1	
0	BH05 0.4-0.5	14/07/22	Soil										_			1		
	5. A. C.F	Total	Counts	5	5								-			10	5	164.20
lethod of Shipment	Courier (#	)	Hand Delivered		Postal	Name	Billy	Snow	Signature	B.m.h	~	1	Date	(	4,7	.27	Time	1:45
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Company	Qualtest		Proje	act Ne	NE	W22P-0130	)			P	roject Manag	Emma Co	leman			s	ample	r(0)	E	3illy Sn	ow			
Address	2 Murray Dwyer Circuit M	avtield West NSW 2304	Projec	t Name	МС	C - Ruther	ford				EDD Format FSeld FONIS He	Excel				Han	ded av	ver by						
			Ilates'.													Ema	il for Ir	volca	ie.	accou	ints@	Qualtest.com.	au	
Contact Name	Emma Coleman		olul <sup>4</sup> or "F TE pricing													Ema	il for R	esults	lit e'	bbybetz( mmacole	@qualte eman@	est.com.au billysnow@q qualtest.com.au stepho	ualtest.com.au	au
Phone Ne			as e specify "T t attract 8U	s, Metals												io.	hanga o	Cont vision y	ainers pe 8 cm	e fineces	tiny :	Required Tur Default will b	naround Time (TA e 5 days il not texted	ŋ
Special Directio	ns		Analys a triquested: please oth must the used to	tH, BTEX, PAHs	bestos (%w/w)													SS		e	E) Guidelineet	Generation Cvernight (response)	eporting by 9am)+	ic.
Purchase Orde	*		u netals i SUITE o	B7 - TR	Ast				_	-			-			Plastic	Plastic Plastic	ber Gla	OA vial	AS Bott	Or HDP	2 days♦	☐ 3 da s ♦	
Quote ID Ne	180622QUAN-3		Area -	Suite												500mL	250mL		40mL V	OmL PF	r (Glass etne AcA			)
Na	Client Semple ID	Sampled Date/Time colonalyy hham	Matrix Solid (S) Weller (W)															20		22	Ja Other (Ashe	8ample / Dangerous Go	I Comments Iods Hazard Warn	ing
1	BH06 0.0-0.1	14/07/22	Soil	X	X		I													ſ	1 1			
2	BH06 0.4-0.5	14/07/22	Soil																	1	1	1		
3	BH07 0.0-0.1	14/07/22	Soil	×	×	1														1	1			
4	BH07 0.4-0.5	14/07/22	Soil																	1				
5	BH08 0.0-0.1	14/07/22	Soil	×	×															1	1			
6	BH08 0.3-0.4	14/07/22	Soil						u i											1				
7	BH09 0.0-0.1	14/07/22	Soil	×	×															1	1			
.0	BH09 0.5-0.6	14/07/22	Soil																-	1	1			
9	BH09 0.7-0.8	14/07/22	Soil																	1				1
10	D.14.7.22	14/07/22	Soll	×																1				-
		Total (	Counts	5	4															10	5	1. Sauce	1423	
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Succline Equiportiant, Testing Australia Hey Ltd.

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Company	Qualtest		Projec	t Ne	NEW22P-01	130		Project Manager	Emma Col	eman		s	ampler(	(5)	Bi	lly Sno	w		a state to
Address	2 Murray Dwyer Circuit Ma	avfield West NSW 2304	Project I	Name	MCC - Ruth	erford		EDD Format ESdal EQuiSets	Excel			Han	ded ave	rby					
			linead.									Emai	il for inv	voice	<u>a</u>	ccour	nts@q	ualtest.com.	au
Contact Name	Emma Coleman		Tolait" or "F									Emai	il ter Røi	sults	libt	oybetz@ macolen	qualtest.c nan@qua	om.au billysnow@q ltest.com.au stephc	ualtest.com.au ullen@qualtest.com.au
Phone Na			ies ie spech altract St	s, Metals									unde con	Contai laine lype	iners 8 saul	i) necesso	MY.	Required Tur Detaol will b	naround Time (TAT) « 5 days II not ticked
Special Direction			Analys reduction plose e must be used to	BTEX, PAH	stos (%w/w)												idelines)	Overnight (n	<ul> <li>Fairmangs with molly eporting by 9am)♦</li> </ul>
Purchase Order				7 - TRH,	Asbe						_	astic	astic	er Glass	A vial	S Bottle	WA Gu	□ 2 days ♦	□ 1 day ♦ □ 3 days ♦
Quote ID Ne	180622QUAN-3		Muers -	Suite B								500mL PI	230mL PI 125mL PI	mL Ambe	10mL VO/	)mL PFA( (Glass ol	tos AS496	5 days (Stan     Other(	idard)
N	Client Sample ID	Sempled Deta/Time ashualyy blower	Matrix Sukt (3) Water (W)											200		500 Jar	Other (Asbes	Sample / Dangeroux Go	a Comments loods Hazard Warning
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Eurofins Environment Testing

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![](_page_67_Picture_0.jpeg)

### **Environment Testing**

#### Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521								
Melbourne	Geelong	Sydney	Ca					
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Dandenong South	Grovedale	Girraween	Mit					
VIC 3175	VIC 3216	NSW 2145	AC					
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel					
NATA# 1261 Site# 1254	NATA# 1261 Site# 1254	NATA# 1261 Site# 18217						

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EnviroSales@eurofins.com

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

#### **Sample Receipt Advice**

Company name:	Qualtest
Contact name:	Emma Coleman
Project name:	MCC - RUTHERFORD
Project ID:	NEW22P-0130
Turnaround time:	5 Day
Date/Time received	Jul 14, 2022 2:37 PM
Eurofins reference	906021

#### **Sample Information**

- A detailed list of analytes logged into our LIMS, is included in the attached summary table. 1
- 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. ./
- X Split sample sent to requested external lab.
- X Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

#### **Notes**

Sample Jar BH05 0.4-0.5 missing

#### 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 Emma Coleman - emmacoleman@qualtest.com.au.

Note: A copy of these results will also be delivered to the general Qualtest email address.

### Global Leader - Results you can trust

![](_page_68_Picture_0.jpeg)

# Certificate of Analysis

# **Environment Testing**

Qualtest 2 Murray Dwyer Circuit Mayfield West NSW 2304

![](_page_68_Picture_4.jpeg)

NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention:	Emma Coleman
Report	906021-AID-V2
Project Name	MCC - RUTHERFORD
Project ID	NEW22P-0130
Received Date	Jul 14, 2022
Date Reported	Aug 09, 2022
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.

![](_page_69_Picture_0.jpeg)

# **Environment Testing**

Project Name	MCC - RUTHERFORD
Project ID	NEW22P-0130
Date Sampled	Jul 14, 2022
Report	906021-AID-V2

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH01 0.0-0.1	22-JI0029987	Jul 14, 2022	Approximate Sample 800g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH02 0.0-0.1	22-JI0029988	Jul 14, 2022	Approximate Sample 801g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH03 0.0-0.1	22-JI0029989	Jul 14, 2022	Approximate Sample 677g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH04 0.0-0.1	22-JI0029990	Jul 14, 2022	Approximate Sample 551g Sample consisted of: Brown coarse-grained clayey sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH05 0.0-0.1	22-JI0029991	Jul 14, 2022	Approximate Sample 765g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH06 0.0-0.1	22-JI0029992	Jul 14, 2022	Approximate Sample 749g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH07 0.0-0.1	22-JI0029993	Jul 14, 2022	Approximate Sample 717g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
BH08 0.0-0.1	22-JI0029994	Jul 14, 2022	Approximate Sample 611g Sample consisted of: Brown coarse-grained clayey sandy soil, bitumen and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

![](_page_70_Picture_0.jpeg)

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH09 0.0-0.1	22-JI0029995	Jul 14, 2022	Approximate Sample 896g Sample consisted of: Brown coarse-grained clayey sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

![](_page_71_Picture_0.jpeg)

# Environment Testing

#### **Sample History**

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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 SiteExtractedSydneyJul 18, 2022

Holding Time Indefinite
•• C'			Eurofins Env	ironme	nt Testing Australia I	Pty Ltd	Eurofins ARL Pty Ltd	Eurofins Environm	ent Testing NZ Ltd						
web: www.eurofins.com.au email: EnviroSales@eurofins.com				d ith 5000 e# 1254	Geelong         Sydney           19/8 Lewalan Street         179 Mago           Grovedale         Girraweer           VIC 3216         NSW 214           Tel: +61 3 8564 5000         Tel: +61 2           54         NATA# 1261 Site# 1254			/ gowar Road sen 145 1 2 9900 8400 1261 Site# 18217		erra ,2 Dacr ell 2911 61 2 61	Brisbane         Newcastle           e Street         1/21 Smallwood Place         4/52 Industrial D           Murarrie         Mayfield East N:           QLD 4172         PO Box 60 Wick           13 8091         Tel: +61 7 3902 4600         Tel: +61 2 4968           NATA# 1261 Site# 20794         NATA# 1261 Site	rive SW 2304 ham 2293 8448 e# 25079	Perth 46-48 Banksia Road Welshpool WA 6106 Tel: +61 8 6253 4444 NATA# 2377 Site# 2370	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290
Company Name:QualtestAddress:2 Murray Dwyer CircuitMayfield WestNSW 2304							O Re Pl Fa	rder N eport hone: ax:	lo.: #:	906021 02 4968 4468 02 4960 9775		Received: Due: Priority: Contact Name:	Jul 14, 2022 2:37 F Jul 21, 2022 5 Day Emma Coleman	PM	
Pr Pr	oject Name: oject ID:	MCC - RUT NEW22P-01	HERFORD 30									Eu	urofins Analytical Serv	vices Manager : Ar	ndrew Black
Sample Detail					Asbestos - WA guidelines	HOLD	Moisture Set	Eurofins Suite B7							
Syd	ney Laboratory	- NATA # 1261	Site # 18217	,			x	X	Х	Х	-				
Exte	ernal Laboratory														
No	Sample ID	Sample Date	Time	M	atrix LAB	ID									
1	BH01 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29987	х		Х	х					
2	BH02 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29988	х		Х	х					
3	BH03 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29989	Х		Х	Х					
4	BH04 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29990	Х		Х	Х	-				
5	BH05 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29991	Х		Х	Х	-				
6	BH06 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29992	Х		Х	Х	-				
7	BH07 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29993	X		Х	Х	-				
8	BH08 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29994	X		Х	X					
9	BH09 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29995	X		X	X					
10	D.14.7.22	Jul 14, 2022		Soil	N22-JI00	29996			X	X					
11	BH01 0.4-0.5	Jul 14, 2022		Soil	N22-JI00	29997		X			-				
12	BH02 0.4-0.5	Jul 14, 2022		Soll	N22-JI00	29998		X			-				
13	BH03 0.4-0.5	Jul 14, 2022		Soil	N22-JI00	29999		X			J				

Eurofins Environment Testing Australia Pty Ltd           ABN: 50 005 085 521												Eurofins ARL Pty Ltd ABN: 91 05 0159 898	Eurofins Environm	ent Testing NZ Lto
			Melbourne 6 Monterey Road Dandenong South VIC 3175	Geelong 19/8 Lewalan Street Grovedale VIC 3216	Sydney 179 Magowar Road Girraween NSW 2145		Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tolv 64 2 6112 8001		e Street 1/21 Smallwood Place Murarrie QLD 4172	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293	Perth 46-48 Banksia Road Welshpool WA 6106	Auckland 35 O'Rorke Road Penrose, Auckland 1061	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675	
email:	EnviroSales@eurofins	s.com	NATA# 1261 Site# 1254	NATA# 1261 Site# 1254	NATA# 12	2 9900 8 261 Site	8400 # 1821	7 Tel: +	61261	NATA# 1261 Site# 2079	4 NATA# 1261 Site# 25079	NATA# 2377 Site# 2370	IANZ# 1327	IANZ# 1290
Co Ao	Company Name:       Qualtest         Address:       2 Murray Dwyer Circuit         Mayfield West       NSW 2304					Order No.: Report #: Phone: Fax:			906021 02 4968 4468 02 4960 9775		Received: Due: Priority: Contact Name:	Jul 14, 2022 2:37 F Jul 21, 2022 5 Day Emma Coleman	PM	
Project Name: MCC - RUTHERFORD Project ID: NEW22P-0130											E	urofins Analytical Serv	vices Manager : Ar	ndrew Black
Sample Detail				Asbestos - WA guidelines	HOLD	Moisture Set	Eurofins Suite B7							
Syd	ney Laboratory	- NATA # 1261	Site # 18217			X	X	Х	Х					
14	BH04 0.4-0.5	Jul 14, 2022	Soil	N22-JI00	30000		X							
15	BH06 0.4-0.5	Jul 14, 2022	Soil	N22-JI00	30001		X							
16	BH07 0.4-0.5	Jul 14, 2022	Soll	N22-JI00	30002		X							
10		Jul 14, 2022	5011		20004									
10	BH09 0.3-0.8	Jul 14, 2022	Soil	N22-1100	30004		x	<u> </u>						
20	T 14 7 22	Jul 14, 2022	Soil	N22-3100	30005		x							
Tes	t Counts	00117,2022		1122 0100		9	10	10	10					
									•	•				



## Internal Quality Control Review and Glossary General

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- 2 3
- 4. 5.
- QC data may be available on request. All soil results are reported on a dry basis, unless otherwise stated. Samples were analysed on an 'as received' basis. Information identified on this report with the colour blue indicates data provided by customer that may have an impact on the results. Information identified on this report with the colour **orange** indicates sections of the report not covered by the laboratory's scope of NATA accreditation. This report replaces any interim results previously issued.
- 6.

## **Holding Times**

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001). 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: F/fld F/mL g, kg g/kg L, mL L/min min	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (% w/w) Airborne fibre filter loading as Fibres (N) per Fields counted (n) Airborne fibre reported concentration as Fibres per millilitier of air drawn over the sampler membrane (C) Mass, e.g. of whole sample (M) or asbestos-containing find within the sample (m) Concentration in grams per kilogram Volume, e.g. of air as measured in AFM (V = r x t) Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (r) Time (t), e.g. of air sample collection period
Calculations	
Airborne Fibre Concentration:	$C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{v}\right)$
Asbestos Content (as asbestos):	$\% w/w = \frac{(m \times P_A)}{M}$
Weighted Average (of asbestos):	$\mathscr{H}_{WA} = \sum \frac{(m \times P_A)_X}{x}$
Terms %asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 Appendix 2, else assumed to be 15% in accordance with WA DOH Appendix 2 ( <b>P</b> <sub>A</sub> ).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to "non-bonded / friable".
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (% w/w).
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
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.
HSG248	UK HSE HSG248, Asbestos: The Analysts Guide, 2nd Edition (2021).
HSG264	UK HSE HSG264, Asbestos: The Survey Guide (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (K) as derived from the effective filter area of the given AFM membrane used for collecting the sample (A) and the projected eyepiece graticule area of the specific microscope used for the analysis (a).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
I race Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
	Unidentified witheratin Fubre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004 May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
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 (updated 2021), including Appendix Four: Laboratory analysis
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (%wA).



## 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

## Asbestos Counter/Identifier:

Sayeed Abu

Senior Analyst-Asbestos

### Authorised by:

Laxman Dias

Senior Analyst-Asbestos

li falle

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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NATA

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

NATA Accredited Accreditation Number 1261 Site Number 18217

Qualtest 2 Murray Dwyer Circuit Mayfield West NSW 2304

Attention:

Emma Coleman

Report Project name Project ID Received Date 906021-S-V2 MCC - RUTHERFORD NEW22P-0130 Jul 14, 2022

				1	1	
Client Sample ID			BH01 0.0-0.1	BH02 0.0-0.1	BH03 0.0-0.1	BH04 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N22-JI0029987	N22-JI0029988	N22-JI0029989	N22-JI0029990
Date Sampled			Jul 14, 2022	Jul 14. 2022	Jul 14. 2022	Jul 14. 2022
Test/Reference	LOR	Unit		, -		, -
Total Recoverable Hydrocarbons - 1999 NEPM Fract	ions	Onit				
TRH C6-C9	20	ma/ka	< 20	< 20	< 20	< 20
TBH C10-C14	20	ma/ka	< 20	< 20	< 20	< 20
TRH C15-C28	50	ma/ka	< 50	< 100	78	210
TRH C29-C36	50	ma/ka	< 50	80	78	180
TRH C10-C36 (Total)	50	ma/ka	< 50	< 100	156	520
BTEX						010
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	ma/ka	< 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	%	135	95	94	94
Total Recoverable Hydrocarbons - 2013 NEPM Fract	ions					
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 2	< 2	< 1
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	< 2	2.1	< 1
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	2.0	2.3	1.3
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	< 2	< 1	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	1.0	0.9	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	1.1	1.4	0.6
Benzo(b&j)fluoranthene <sup>N07</sup>	0.5	mg/kg	< 0.5	0.7	0.7	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 2	< 2	< 1
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	1.3	1.3	0.6
Chrysene	0.5	mg/kg	< 0.5	1.2	1.4	0.6
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.6	2.9	3.0	1.0
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	0.7	0.9	< 0.5



Client Sample ID			BH01 0.0-0.1	BH02 0.0-0.1	BH03 0.0-0.1	BH04 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N22-JI0029987	N22-JI0029988	N22-JI0029989	N22-JI0029990
Date Sampled			Jul 14, 2022	Jul 14, 2022	Jul 14, 2022	Jul 14, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 2	0.8	< 0.5
Pyrene	0.5	mg/kg	< 0.5	1.7	1.5	0.5
Total PAH*	0.5	mg/kg	0.6	11	12	3.3
2-Fluorobiphenyl (surr.)	1	%	129	113	Q09INT	139
p-Terphenyl-d14 (surr.)	1	%	65	65	60	91
Total Recoverable Hydrocarbons - 2013 NEPM Fract	ions					
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 200	130	310
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	140
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 200	130	590
Heavy Metals						
Arsenic	2	mg/kg	5.6	2.8	6.9	4.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	12	19	11
Copper	5	mg/kg	< 5	7.3	9.6	18
Lead	5	mg/kg	14	8.5	14	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	2.4	< 0.1
Nickel	5	mg/kg	5.9	10.0	14	7.9
Zinc	5	mg/kg	21	87	140	79
% Moisture	1	%	11	16	22	24

Client Sample ID			BH05 0.0-0.1	BH06 0.0-0.1	BH07 0.0-0.1	BH08 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N22-JI0029991	N22-JI0029992	N22-JI0029993	N22-JI0029994
Date Sampled			Jul 14, 2022	Jul 14, 2022	Jul 14, 2022	Jul 14, 2022
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fract	ions					
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	< 100	< 50	150
TRH C29-C36	50	mg/kg	< 50	62	< 50	140
TRH C10-C36 (Total)	50	mg/kg	< 50	< 100	< 50	290
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	%	121	102	104	111
Total Recoverable Hydrocarbons - 2013 NEPM Fract						
Naphthalene <sup>N02</sup>	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2) <sup>N01</sup>	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	mg/kg	< 20	< 20	< 20	< 20



Client Sample ID			BH05 0.0-0.1	BH06 0.0-0.1	BH07 0.0-0.1	BH08 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N22-JI0029991	N22-JI0029992	N22-JI0029993	N22-JI0029994
Date Sampled			Jul 14, 2022	Jul 14, 2022	Jul 14, 2022	Jul 14, 2022
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons		1				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.4
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	1.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.9
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	1.1
Benzo(b&j)fluoranthene <sup>N07</sup>	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	0.7
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
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	0.6	1.6
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	1.0
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	1.3
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	1.1	9.5
2-Fluorobiphenyl (surr.)	1	%	143	127	115	105
p-Terphenyl-d14 (surr.)	1	%	125	85	94	79
Total Recoverable Hydrocarbons - 2013 NEPM Fract	ions					
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	100	< 100	240
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	100	< 100	360
Heavy Metals						
Arsenic	2	mg/kg	13	5.0	8.1	5.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	31	21	26	37
Copper	5	mg/kg	< 5	9.8	13	18
Lead	5	mg/kg	12	11	15	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.6	14	16	27
Zinc	5	mg/kg	37	97	75	70
% Moisture	1	%	18	23	32	26



Client Sample ID			BH09 0.0-0.1	D.14.7.22
Sample Matrix			Soil	Soil
Eurofins Sample No.			N22-JI0029995	N22-JI0029996
Date Sampled			Jul 14, 2022	Jul 14. 2022
	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fract	ions	Offic		
	20	ma/ka	< 20	< 20
TRH C10-C14	20	ma/ka	< 20	< 20
TRH C15-C28	50	ma/ka	73	< 100
TRH C29-C36	50	ma/ka	92	60
TRH C10-C36 (Total)	50	ma/ka	165	< 100
BTEX				
Benzene	0.1	ma/ka	< 0.1	< 0.1
Toluene	0.1	ma/ka	< 0.1	< 0.1
Ethylbenzene	0.1	ma/ka	< 0.1	< 0.1
m&p-Xylenes	0.2	ma/ka	< 0.2	< 0.2
o-Xylene	0.1	ma/ka	< 0.1	< 0.1
Xvlenes - Total*	0.3	ma/ka	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	70	104
Total Recoverable Hydrocarbons - 2013 NEPM Fract	ions			-
Naphthalene <sup>N02</sup>	0.5	ma/ka	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (E2) <sup>N01</sup>	50	ma/ka	< 50	< 50
TRH C6-C10	20	ma/ka	< 20	< 20
TRH C6-C10 less BTEX (F1) <sup>N04</sup>	20	ma/ka	< 20	< 20
Polycyclic Aromatic Hydrocarbons	20	iiig/kg	120	120
Benzo(a)pyrene TEQ (lower bound) *	0.5	ma/ka	17	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	ma/ka	1.9	0.6
Benzo(a)pyrene TEQ (incention bound) *	0.5	ma/ka	2.2	1.2
Acenaphthene	0.5	ma/ka	< 0.5	< 0.5
Acenaphthylene	0.5	ma/ka	< 0.5	< 0.5
Anthracene	0.5	ma/ka	< 0.5	< 0.5
Benz(a)anthracene	0.5	ma/ka	0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	1.3	< 0.5
Benzo(b&i)fluoranthene <sup>N07</sup>	0.5	mg/kg	0.6	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	1.0	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	1.1	< 0.5
Chrysene	0.5	mg/kg	0.9	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	1.9	0.6
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	1.1	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	0.6	< 0.5
Pyrene	0.5	mg/kg	1.6	< 1
Total PAH*	0.5	mg/kg	11	< 1
2-Fluorobiphenyl (surr.)	1	%	93	122
p-Terphenyl-d14 (surr.)	1	%	86	73
Total Recoverable Hydrocarbons - 2013 NEPM Fract	ions			
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	130	< 200
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	130	< 200



Client Sample ID Sample Matrix Eurofins Sample No. Date Sampled			BH09 0.0-0.1 Soil N22-JI0029995 Jul 14, 2022	D.14.7.22 Soil N22-JI0029996 Jul 14, 2022
Test/Reference	LOR	Unit		
Heavy Metals				
Arsenic	2	mg/kg	6.6	6.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	37	22
Copper	5	mg/kg	8.7	< 5
Lead	5	mg/kg	9.8	18
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	15	9.7
Zinc	5	mg/kg	39	29
% Moisture	1	%	15	12



# Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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	Aug 08, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jul 21, 2022	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 21, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Aug 08, 2022	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Aug 08, 2022	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Jul 21, 2022	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jul 15, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			

web: www.eurofins.com.au email: EnviroSales@eurofins.com			Eurofins Env ABN: 50 005 08	ironment	Testing Australia I	Eurofins ARL Pty Ltd	Eurofins Environment Testing NZ Ltd NZBN: 9429046024954								
			Melbourne 6 Monterey Roa Dandenong Sou VIC 3175 Tel: +61 3 8564 NATA# 1261 Sit	Seelong 9/8 Lewalan Street Grovedale IIC 3216 iel: +61 3 8564 5000 IATA# 1261 Site# 1254	Sydney           et         179 Magowar Road           Girraween         NSW 2145           000         Tel: +61 2 9900 8400           ± 1254         NATA# 1261 Site# 182		ad 3400 # 1821	Canberra Unit 1,2 Dacre Street Mitchell ACT 2911 Tel: +61 2 6113 8091 217		Brisbane e Street 1/21 Smallwood Place Murarrie QLD 4172 13 8091 Tel: +61 7 3902 4600 NATA# 1261 Site# 20794	Newcastle 4/52 Industrial Drive Mayfield East NSW 2304 PO Box 60 Wickham 2293 Tel: +61 2 4968 8448 4 NATA# 1261 Site# 25079	Perth           46-48 Banksia Road           Welshpool           WA 6106           Tel: +61 8 6253 4444           NATA# 2377 Site# 2370	Auckland 35 O'Rorke Road Penrose, Auckland 1061 Tel: +64 9 526 45 51 IANZ# 1327	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675 Tel: 0800 856 450 IANZ# 1290	
Co Ad	Company Name:       Qualtest         Address:       2 Murray Dwyer Circuit         Mayfield West       NSW 2304							Oi Re Pl Fa	der N eport none: ix:	lo.: #:	906021 02 4968 4468 02 4960 9775		Received:Jul 14, 2022 2:37 PMDue:Jul 21, 2022Priority:5 DayContact Name:Emma Coleman		
Pro Pro	Project Name:       MCC - RUTHERFORD         Project ID:       NEW22P-0130											E	urofins Analytical Ser	vices Manager : Ar	drew Black
Sample Detail					Asbestos - WA guidelines	HOLD	Moisture Set	Eurofins Suite B7							
Syd	ney Laboratory	- NATA # 1261	Site # 18217	•			х	Х	х	Х	-				
Exte	ernal Laboratory	/													
No	Sample ID	Sample Date	Sampling Time	Mat	trix LAB	ID									
1	BH01 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29987	Х		Х	Х					
2	BH02 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29988	Х		Х	Х					
3	BH03 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29989	Х		Х	Х					
4	BH04 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29990	Х		Х	Х	-				
5	BH05 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29991	Х		Х	Х	-				
6	BH06 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29992	Х		Х	Х	-				
7	BH07 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29993	Х		Х	Х	-				
8	BH08 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29994	X		X	X					
9	BH09 0.0-0.1	Jul 14, 2022		Soil	N22-JI00	29995	X		X	X	4				
10	DU04.0.4.0.5	Jul 14, 2022		501	N22-J100	29996		~	X	X	4				
11		Jul 14, 2022		Soil	N22-J100	29991					-				
12	BH03 0 4 0 5	Jul 14, 2022		Soil	N22-JIUU	20000		×			4				
13	10103 0.4-0.5	JUI 14, 2022		3011	JIUU	29999		^			]				

			Eurofins Environme	ent Testing Australia F	Pty Ltd						Eurofins ARL Pty Ltd	Eurofins Environme	ent Testing NZ Ltd
🔅 eurofins		ABN: 50 005 085 521		ABN: 91 05 0159 898									
		11112	Melbourne         Geelong         Sydne           6 Monterey Road         19/8 Lewalan Street         179 M:           Dandenong South         Grovedale         Girraw           VIC 3175         VIC 3246         NSW/		Sydney 179 Mago Girraweer NSW 214	iydney 79 Magowar Road Sirraween			erra ,2 Dacr ell 2911	Brisbane Newcastle 2 Street 1/21 Smallwood Place 4/52 Industrial Drive Murarrie Mayfield East NSW 2304 QLD 4172 PO Box 60 Wickham 2293	Perth 46-48 Banksia Road Welshpool WA 6106	Auckland 35 O'Rorke Road Penrose, Auckland 1061	Christchurch 43 Detroit Drive Rolleston, Christchurch 7675
web:         www.eurofins.com.au         Tel: +61 3 8564 5000         Tel: +61 3 8564 5000         Tel: +61 3 8564 5000         Tel: +61 2 95           email:         EnviroSales@eurofins.com         NATA# 1261 Site# 1254         NATA# 1261 Site# 1254         NATA# 1261			2 9900 8 261 Site	3400 # 1821	Tel: + 7	61 2 61	I3 8091 Tel: +61 7 3902 4600 Tel: +61 2 4968 8448 NATA# 1261 Site# 20794 NATA# 1261 Site# 25079	Tel: +61 8 6253 4444 NATA# 2377 Site# 2370	Tel: +64 9 526 45 51 IANZ# 1327	Tel: 0800 856 450 IANZ# 1290			
Co Ad	mpany Name: dress:	Qualtest 2 Murray Dy Mayfield We NSW 2304	wyer Circuit est				OI Re Pl Fa	rder N eport none: ax:	lo.: #:	906021 02 4968 4468 02 4960 9775	Received: Due: Priority: Contact Name:	Jul 14, 2022 2:37 P Jul 21, 2022 5 Day Emma Coleman	М
Pro Pro	oject Name: oject ID:	MCC - RUT NEW22P-0 <sup>-</sup>	HERFORD 130							Ει	rofins Analytical Serv	vices Manager : An	drew Black
		S	ample Detail			Asbestos - WA guidelines	HOLD	Moisture Set	Eurofins Suite B7				
Sydi	ey Laboratory	- NATA # 1261	Site # 18217			Х	Х	Х	Х				
14	BH04 0.4-0.5	Jul 14, 2022	Soil	N22-JI00	30000		X						
15	BH06 0.4-0.5	Jul 14, 2022	Soil	N22-JI00	30001		X						
16	BH07 0.4-0.5	Jul 14, 2022	Soil	N22-JI00	30002		Х						
17	BH08 0.4-0.5	Jul 14, 2022	Soil	N22-JI00	30003		X						
18	BH09 0.5-0.6	Jul 14, 2022	Soil	N22-JI00	30004		X						
19	BH09 0.7-0.8	Jul 14, 2022	Soil	N22-JI00	30005		X						
20	T.14.7.22	Jul 14, 2022	Soil	N22-JI00	30006		X						
Test	Counts					9	10	10	10				



### 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.

### Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	μg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

#### Terms

АРНА	American Public Health Association
сос	Chain of Custody
СР	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
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.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
ТВТО	Tributyltin oxide ( <i>bis</i> -tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

### **QC** - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented 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%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

### **QC Data General Comments**

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. 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.
- 4. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- 5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 6. 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		1	1	1	r	
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		1				
втех						
Benzene	mg/kg	< 0.1		0.1	Pass	
Toluene	mg/kg	< 0.1		0.1	Pass	
Ethylbenzene	mg/kg	< 0.1		0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2		0.2	Pass	
o-Xylene	mg/kg	< 0.1		0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3		0.3	Pass	
Method Blank						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	-					
Naphthalene	mg/kg	< 0.5		0.5	Pass	
TRH C6-C10	mg/kg	< 20		20	Pass	
Method Blank						
Polycyclic Aromatic Hydrocarbons	-					
Acenaphthene	mg/kg	< 0.5		0.5	Pass	
Acenaphthylene	mg/kg	< 0.5		0.5	Pass	
Anthracene	mg/kg	< 0.5		0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5		0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5		0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5		0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5		0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5		0.5	Pass	
Chrysene	mg/kg	< 0.5		0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5		0.5	Pass	
Fluoranthene	mg/kg	< 0.5		0.5	Pass	
Fluorene	mg/kg	< 0.5		0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5		0.5	Pass	
Naphthalene	mg/kg	< 0.5		0.5	Pass	
Phenanthrene	mg/kg	< 0.5		0.5	Pass	
Pyrene	mg/kg	< 0.5		0.5	Pass	
Total PAH*	mg/kg	-		0.5	N/A	
Method Blank		1	1 1	1	-	
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	1					
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		1	1	1		
Heavy Metals	1					
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	



Test			Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons -	1999 NEPM Fract	ions					
TRH C6-C9			%	85	70-130	Pass	
TRH C10-C14			%	98	70-130	Pass	
LCS - % Recovery					 		
BTEX							
Benzene			%	86	70-130	Pass	
Toluene			%	88	70-130	Pass	
Ethylbenzene			%	90	70-130	Pass	
m&p-Xylenes			%	85	70-130	Pass	
o-Xylene			%	91	70-130	Pass	
Xylenes - Total*			%	87	70-130	Pass	
LCS - % Recovery				1	T	1	
Total Recoverable Hydrocarbons -	2013 NEPM Fract	ions					
Naphthalene			%	92	70-130	Pass	
TRH C6-C10			%	81	70-130	Pass	
LCS - % Recovery				1			
Polycyclic Aromatic Hydrocarbons	5						
Acenaphthene			%	88	70-130	Pass	
Acenaphthylene			%	74	70-130	Pass	
Anthracene			%	130	70-130	Pass	
Benz(a)anthracene			%	93	70-130	Pass	
Benzo(a)pyrene			%	92	70-130	Pass	
Benzo(b&j)fluoranthene			%	79	70-130	Pass	
Benzo(g.h.i)perylene			%	120	70-130	Pass	
Benzo(k)fluoranthene			%	102	70-130	Pass	
Chrysene			%	78	70-130	Pass	
Dibenz(a.h)anthracene			%	79	70-130	Pass	
Fluoranthene			%	100	70-130	Pass	
Fluorene			%	109	70-130	Pass	
Indeno(1.2.3-cd)pyrene			%	78	70-130	Pass	
Naphthalene			%	80	70-130	Pass	
Phenanthrene			%	87	70-130	Pass	
Pyrene			%	83	70-130	Pass	
LCS - % Recovery				L	1	-	
Total Recoverable Hydrocarbons -	2013 NEPW Fract	ions	0/	05	70.400	Dees	
			%	95	70-130	Pass	
LCS - % Recovery							
Aroopio			0/	0.0	80.120	Dooo	
Cadmium			-70 0/	90	80.120	Pass	
Chromium			/0 0/_	100	80-120	Pass	
Copper			70 0/_	00	80-120	Dass	
Lead			/0 0/_	100	80-120	Pass	
Mercury			70 %	88	80-120	Pass	
Nickel			70 0/_	101	80-120	Dass	
Zinc			%	96	80-120	Page	
Test	Lab Sample ID	QA	Units	Result 1	Acceptance	Pass	Qualifying
Spike - % Recovery	· ·	Source				Linits	Coue
Total Recoverable Hydrocarbons -	1999 NEPM Fract	ions		Result 1			
TRH C6-C9	S22-JI0035301	NCP	%	115	70-130	Pass	
Spike - % Recoverv							
BTEX				Result 1			
Benzene	S22-JI0035301	NCP	%	103	70-130	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	S22-JI0035301	NCP	%	109			70-130	Pass	
Ethylbenzene	S22-JI0035301	NCP	%	113			70-130	Pass	
m&p-Xylenes	S22-JI0035301	NCP	%	113			70-130	Pass	
o-Xylene	S22-JI0035301	NCP	%	113			70-130	Pass	
Xylenes - Total*	S22-JI0035301	NCP	%	113			70-130	Pass	
Spike - % Recovery							•		
Total Recoverable Hydrocarbons -	2013 NEPM Fract	ions		Result 1					
Naphthalene	S22-JI0035301	NCP	%	99			70-130	Pass	
TRH C6-C10	S22-JI0035301	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S22-Jn0066558	NCP	%	98			75-125	Pass	
Cadmium	S22-JI0038446	NCP	%	114			75-125	Pass	
Chromium	S22-JI0038446	NCP	%	117			75-125	Pass	
Copper	S22-JI0038446	NCP	%	108			75-125	Pass	
Lead	S22-JI0038446	NCP	%	117			75-125	Pass	
Mercury	S22-Jn0066558	NCP	%	110			75-125	Pass	
Nickel	S22-JI0038446	NCP	%	115			75-125	Pass	
Zinc	S22-JI0038446	NCP	%	93			75-125	Pass	
Spike - % Recovery				1					
Total Recoverable Hydrocarbons -	1999 NEPM Fract	ions		Result 1					
TRH C10-C14	N22-JI0029994	CP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons -	2013 NEPM Fract	ions		Result 1					
TRH >C10-C16	N22-JI0029994	CP	%	80			70-130	Pass	
Test	Lab Sample ID	QA	Units	Result 1			Acceptance	Pass	Qualifying
Dunlicate		oource					Linits	Linits	oouc
Total Recoverable Hydrocarbons -	1999 NEPM Fract	ions		Result 1	Result 2	RPD			
TRH C6-C9	S22-JI0035298	NCP	ma/ka	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S22-JI0035298	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S22-JI0035298	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S22-JI0035298	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S22-JI0035298	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S22-JI0035298	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S22-JI0035298	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons -	2013 NEPM Fract	ions		Result 1	Result 2	RPD			
Naphthalene	S22-JI0035298	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S22-JI0035298	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate		1101							
Polycyclic Aromatic Hydrocarbons		1101							
Aconontthono	3			Result 1	Result 2	RPD			
Acenaphinene	S22-JI0029776	NCP	mg/kg	Result 1 < 0.5	Result 2 < 0.5	RPD <1	30%	Pass	
Acenaphthylene	S22-JI0029776 S22-JI0029776	NCP NCP	mg/kg mg/kg	Result 1 < 0.5 < 0.5	Result 2 < 0.5 < 0.5	RPD <1 <1	30% 30%	Pass Pass	
Acenaphthylene Anthracene	S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP	mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5	RPD <1 <1 <1 <1	30% 30% 30%	Pass Pass Pass	
Acenaphthylene Anthracene Benz(a)anthracene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5 < 0.5	RPD <1 <1 <1 <1 <1	30% 30% 30% 30%	Pass Pass Pass Pass	
Acenaphthylene Anthracene Benz(a)anthracene Benzo(a)pyrene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	RPD <1 <1 <1 <1 <1 <1 <1	30% 30% 30% 30% 30%	Pass Pass Pass Pass Pass	
Acenaphthene Acenaphthylene Anthracene Benz(a)anthracene Benzo(a)pyrene Benzo(b&j)fluoranthene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	RPD           <1	30% 30% 30% 30% 30% 30%	Pass Pass Pass Pass Pass Pass	
Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b&j)fluoranthene Benzo(g.h.i)perylene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	RPD           <1	30% 30% 30% 30% 30% 30% 30%	Pass Pass Pass Pass Pass Pass Pass	
Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b&j)fluoranthene Benzo(g.h.i)perylene Benzo(k)fluoranthene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP NCP NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	RPD           <1	30% 30% 30% 30% 30% 30% 30% 30%	Pass Pass Pass Pass Pass Pass Pass Pass	
Acenaphthlene         Acenaphthylene         Anthracene         Benz(a)anthracene         Benzo(a)pyrene         Benzo(b&j)fluoranthene         Benzo(g.h.i)perylene         Benzo(k)fluoranthene         Chrysene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP NCP NCP NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5	Result 2 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5 < 0.5	RPD           <1	30% 30% 30% 30% 30% 30% 30% 30% 30%	Pass Pass Pass Pass Pass Pass Pass Pass	
Acenaphthylene         Acenaphthylene         Anthracene         Benzo(a)pyrene         Benzo(b&j)fluoranthene         Benzo(g.h.i)perylene         Benzo(k)fluoranthene         Chrysene         Dibenz(a.h)anthracene	S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776 S22-JI0029776	NCP NCP NCP NCP NCP NCP NCP NCP NCP NCP	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	Result 1 < 0.5 < 0.5	Result 2 < 0.5 < 0.5	RPD           <1	30% 30% 30% 30% 30% 30% 30% 30% 30%	Pass Pass Pass Pass Pass Pass Pass Pass	



Duplicate									
Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons					RPD			
Fluorene	S22-JI0029776	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S22-JI0029776	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S22-JI0029776	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S22-JI0029776	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S22-JI0029776	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	N22-JI0029991	CP	%	18	18	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons -	1999 NEPM Fract	ions		Result 1	Result 2	RPD			
TRH C10-C14	N22-JI0029993	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	N22-JI0029993	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	N22-JI0029993	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate				1					
<b>Total Recoverable Hydrocarbons -</b>	2013 NEPM Fract	ions		Result 1	Result 2	RPD			
TRH >C10-C16	N22-JI0029993	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	N22-JI0029993	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	N22-JI0029993	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate				1					
Heavy Metals	1			Result 1	Result 2	RPD			
Arsenic	N22-JI0029993	CP	mg/kg	8.1	8.8	9.0	30%	Pass	
Cadmium	N22-JI0029993	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	N22-JI0029993	CP	mg/kg	26	31	17	30%	Pass	
Copper	N22-JI0029993	CP	mg/kg	13	15	8.0	30%	Pass	
Lead	N22-JI0029993	CP	mg/kg	15	18	16	30%	Pass	
Mercury	N22-JI0029993	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	N22-JI0029993	CP	mg/kg	16	18	11	30%	Pass	
Zinc	N22-JI0029993	CP	mg/kg	75	83	10	30%	Pass	



## Comments

V2- new version with repeated PAHs on JI002994 and 995 as per client request.

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

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).

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.

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

Q09 The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference. Acceptance criteria were met for all other QC

### Authorised by:

Andrew Black	Analytical Services Manager
Charl Du Preez	Senior Analyst-Organic
Gabriele Cordero	Senior Analyst-Metal
Laxman Dias	Senior Analyst-Asbestos
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

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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# 3 DAY TAT ADDITIONAL LEACHATE: FW: Eurofins Test Results, Invoice - Report 906021 : Site MCC - RUTHERFORD (NEW22P-0130)

Andrew Black < Andrew Black@eurofins.com>

Tue 2022-08-02 9:18 AM

To: #AU04\_Enviro\_Sample\_NSW <EnviroSampleNSW@eurofins.com>

**INFO:** INTERNAL EMAIL - Sent from your own Eurofins email domain.

Urgent 3 day TAT additional leachate thanks team

# Andrew Black Analytical Services Manager

# **Eurofins | Environment Testing Australia Pty Ltd**

Unit 7 7 Friesian Close SANDGATE, NSW, 2304 AUSTRALIA Phone: +61 2 9900 8490 Mobile: +61 410 220 750 Email: <u>AndrewBlack@eurofins.com</u> Website: eurofins.com.au/environmental-testing

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From: Billy Snow <BillySnow@qualtest.com.au>
Sent: Tuesday, 2 August 2022 8:46 AM
To: Andrew Black <AndrewBlack@eurofins.com>
Cc: Emma Coleman <EmmaColeman@qualtest.com.au>
Subject: RE: Eurofins Test Results, Invoice - Report 906021 : Site MCC - RUTHERFORD (NEW22P-0130)

**CAUTION:** EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Andrew,

Could I please order a Benzo (a) pyrene TCLP test for the above job, on the following sample:

Sample ID - BH09 0.0-0.1

Kind Regards,

**Billy Snow** Environmental Scientist



Mob:0432 563 250Tel:02 4968 4468Web:www.qualtest.com.au2 Murray Dwyer Circuit, Mayfield West, NSW, 2304Billysnow@qualtest.com.au

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Sent: Monday, 25 July 2022 4:16 PM
To: Emma Coleman <<u>EmmaColeman@qualtest.com.au</u>>
Cc: Amanda Neale <<u>amandaneale@qualtest.com.au</u>>; Billy Snow <<u>BillySnow@qualtest.com.au</u>>; Libby Betz
<<u>LibbyBetz@qualtest.com.au</u>>; Stephanie Cullen <<u>stephcullen@qualtest.com.au</u>>;
Subject: Eurofins Test Results, Invoice - Report 906021 : Site MCC - RUTHERFORD (NEW22P-0130)

Kindest 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: <u>AndrewBlack@eurofins.com</u> Website:[http://]environment.eurofins.com.au <u>View our latest EnviroNotes</u> How did we do? Provide your feedback here





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IANZ# 1327

EnviroSales@eurofins.com

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

# **Sample Receipt Advice**

Company name:	Qualtest
Contact name:	Emma Coleman
Project name:	ADDITIONAL - MCC RUTHERFORD
Project ID:	ADDITIONAL - NEW22P-0130
Turnaround time:	3 Day
Date/Time received	Aug 2, 2022 9:18 AM
Eurofins reference	911479

# **Sample Information**

- A detailed list of analytes logged into our LIMS, is included in the attached summary table. 1
- 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. J
- X Split sample sent to requested external lab.
- X 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 Emma Coleman - emmacoleman@qualtest.com.au.

Note: A copy of these results will also be delivered to the general Qualtest email address.

# Global Leader - Results you can trust



Qualtest 2 Murray Dwyer Circuit Mayfield West NSW 2304

Emma Coleman

Report Project name Project ID Received Date

Attention:

911479-L ADDITIONAL - MCC RUTHERFORD ADDITIONAL - NEW22P-0130 Aug 02, 2022

Client Sample ID Sample Matrix			BH09 0.0-0.1 US Leachate S22-
Eurofins Sample No.			Au0009715
Date Sampled			Jul 14, 2022
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene	0.001	mg/L	< 0.001
USA Leaching Procedure			
Leachate Fluid <sup>C01</sup>		comment	1.0
pH (initial)	0.1	pH Units	6.9
pH (off)	0.1	pH Units	5.1
pH (USA HCI addition)	0.1	pH Units	0.9

Iac-MRA



NATA Accredited Accreditation Number 1261 Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.



# Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

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

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Sydney	Aug 04, 2022	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
USA Leaching Procedure	Sydney	Aug 04, 2022	14 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

			Eurofins Environment Testing Australia Pty Ltd								Eurofins ARL Pty Ltd	Eurofins Environment Testing NZ Ltd	
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Coi Ade	mpany Name: dress:	Qualtest 2 Murray Dv Mayfield We NSW 2304	wyer Circuit est					Order No.:           Report #:         9           Phone:         0;           Fax:         0;	11479 2 4968 4468 2 4960 9775		Received: Due: Priority: Contact Name:	Aug 2, 2022 9:18 A Aug 5, 2022 3 Day Emma Coleman	М
Project Name:ADDITIONAL - MCC RUTHERFORDProject ID:ADDITIONAL - NEW22P-0130								E	urofins Analytical Ser	vices Manager : An	drew Black		
Sample Detail						Benzo(a)pyrene	USA Leaching Procedure						
Sydr	ney Laboratory -	• NATA # 1261	Site # 18217			X		<u>&lt;</u>					
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID								
1	BH09 0.0-0.1	Jul 14, 2022		US Leachate	S22-Au00097	15 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.

### Units

mg/kg: milligrams per kilogram	mg/L: milligrams per litre	μg/L: micrograms per litre
ppm: parts per million	ppb: parts per billion	%: Percentage
org/100 mL: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units	MPN/100 mL: Most Probable Number of organisms per 100 millilitres

#### Terms

АРНА	American Public Health Association
сос	Chain of Custody
СР	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - 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.
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.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
ТВТО	Tributyltin oxide (bis-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

### **QC** - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented 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%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

### **QC Data General Comments**

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. 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.
- 4. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
- 5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
- 6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.



## 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**

Description

Code

C01 Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

### Authorised by:

Robert Biviano Roopesh Rangarajan Analytical Services Manager Senior Analyst-Organic

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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