Preliminary Contamination Assessment

Lot 152 DP 1202468 Raven Street, Kooragang NSW.

NEW20P-0171-AA
8 February 2021

Qualtest
LABORATORY (NSW) PTY LTD

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Document prepared for:

EJE Architecture Pty Ltd
412 King Street
NEWCASTLE NSW 2300

Document prepared by:

Qualtest Laboratory (NSW) Pty Ltd
ABN 98 153 268 89
8 Ironbark Close
Warabrook, NSW 2304
T 02 4968 4468
W www.qualtest.com.au

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Executive Summary

Qualtest Laboratory NSW Pty Ltd (Qualtest) has carried out a Preliminary Contamination Assessment (PCA) for EJE Architecture Pty Ltd (EJE) for a site located at 70 Raven Street (Lot 152 DP1202468), Kooragang, NSW (the site). Figure 1, Appendix A, shows the site location.

The site is owned by Port of Newcastle (PoN), and PoN engaged EJE to lodge a Development Application (DA) for an industrial development. The site is about 1.05ha, and information provided by EJE indicates the available building area on the site is about 5,800m^2. Concept plans indicate the development would include an industrial warehouse style building, covering approximately 3,000m^2.

The objectives of the PCA were to provide an assessment of the likelihood for contamination to be present on the site from past uses and activities, and provide recommendations on the need for further assessment, management and/or remediation (if required).

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

- Desktop study and site history review;
- Site walkover;
- Collection of soil samples from 4 locations;
- Laboratory analysis of soil samples from a suite of common contaminants; and,
- Data assessment and preparation of a Preliminary Contamination Assessment Report.

The site history review showed the site had been undeveloped, potentially stock grazing land until the 1950s to 1960s. In the 1960s and 1980s the site was subjected to filling, likely with dredged material from the Hunter River. From the 1990s the site has been used for vehicle traffic from Raven Street (south) to Port Waratah Coal Services (north), with asphalt paved roads and gravel hardstand being constructed. The site is surrounded by industrial properties on each side.

Two Areas of Environmental Concern (AECs) were identified based on the site history and site observations. The AECs related to: importation of fill; and potential impact from surrounding industrial land uses (including coal services, seed oil processing, metal storage, and waste management).

To provide a preliminary assessment, four sampling locations were carried out across the eastern portion of the site (area of proposed warehouse development). The laboratory results reported concentrations of contaminants below the adopted criteria. Due to the limited sampling carried out, the site was not considered to have been characterised in accordance with NSW EPA (1994) Sampling Design Guidelines.

The Preliminary Conceptual Site Model (CSM) indicated that should soil and/or groundwater contamination exist on the site, then a potential exposure pathway could exist to current and future site users, construction/maintenance workers and the environment.

Based on the site history and observations during field investigations, it is recommended that additional assessment, comprising additional intrusive investigations in the area of proposed building envelope (5,800m^2) in eastern portion of the site, be carried out in accordance with NSW EPA guidelines.

The investigation should include, but not be limited to:

- Additional soil sampling of the fill and underlying natural soils and groundwater;
- Laboratory analysis for a suite of Chemicals of Potential Concern (CPOC); and

- Reporting of the results in a Detailed Contamination Assessment (DCA).

It is noted that current groundwater information may be available for review from existing wells surrounding the site. Provided that the data showed no contamination potentially entering the site from the surrounding area (particularly Port Waratah Coal Services, located up gradient of the site), onsite groundwater investigation and sampling may not be required.

Qualtest completed an Acid Sulfate Soil Assessment in conjunction with the PCA assessment. Based on the field observations, and the laboratory results, the estuarine/alluvial sands and clays below fill material (from about 1.5m bgs) were assessed to comprise Acid Sulfate Soils and a management plan was developed for the site, refer to NEW20P-0171-AC, dated 8 February 2021.

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).

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1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) has carried out a Preliminary Contamination Assessment for EJE Architecture Pty Ltd (EJE) for a site located at 70 Raven Street (Lot 152 DP1202468), Kooragang, NSW (the site). Figure 1, Appendix A, shows the site location.

The site is owned by Port of Newcastle (PoN), who engaged EJE to lodge a Development Application (DA) for an industrial development. The site is about 1.05ha, and information provided by EJE indicates the available building area on the site is about 5,800m^2, located in the eastern portion of the site. Concept plans indicate the development would include an industrial warehouse style building, covering approximately 3,000m^2.

Qualtest were engaged to carry out preliminary geotechnical, contamination and Acid Sulfate Soils (ASS) assessments, which will comprise components of the supporting documentation for the DA lodgement. This report presents the Preliminary Contamination Assessment (PCA) for the site. The geotechnical and acid sulfate soil assessment has been reported separately, ref: NEW20P-0171-AB.

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).

1.1 Objectives

The objectives of the PCA were to provide an assessment of the likelihood for contamination to be present on the site from past uses and activities, 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 objective, Qualtest carried out the following scope:

- Desktop study and site history review;
- Site walkover;
- Collection of soil samples from 4 locations;
- Laboratory analysis of soil samples from a suite of common contaminants; and,
- Data assessment and preparation of a Preliminary Contamination Assessment 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.

Table 2.1: Summary of Site Details

Site Address:	70 Raven Street, Kooragang NSW
Approximate site area and dimensions:	Approx. 1.05 ha Approx. 220m long by 145m wide at its widest and longest points.
Title Identification Details:	Lot 152 DP1202468, within the Newcastle local government area, Parish of Newcastle, County of Northumberland.
Current Zoning	SP1 Special activities
Current Ownership:	Port of Newcastle Lessor Pty Ltd
Current Occupier:	Vacant land used as a carpark, and access from Raven Street to Port Waratah Coal Services to the north.
Previous and Current Landuse:	Vacant land used as a carpark, and access from Raven Street to Port Waratah Coal Services to the north.
Proposed Landuse:	Industrial Development
Adjoining Site Uses:	Heavy industry to the north, east, south and west: • Port Waratah Coal Services to the north and east; • J Steel to the west; and, • Cargills (oil seed processing plant) to the south.
Site Coordinates for approx. centre of site:	32°52'46.96 S 151°46'15.02 E

2.2 Topography and Drainage

Reference to the NSW Land and Property Information Spatial Information Exchange website (https://six.nsw.gov.au/wps/portal/) indicated the elevation of the site was below 10m AHD.

During the site investigation the site was observed to be relatively level, with a very slight slope towards the south. The ground surface consisted of gravel hardstand with some asphalt pavement.

Rain falling on the site would be expected to infiltrate into the site surface. Excess surface water is expected to follow the site topography, and flow to the south towards Raven Street and subsequently into municipal stormwater drains. It is expected that the municipal stormwater system discharges to South Channel of the Hunter River located approximately 840m south of the site.

2.3 Regional Geology

Reference to the 1:100,000 Newcastle-Hunter Coastal Quaternary Geology map indicates that the site is underlain by "*modern fill on Quaternary deposits*".

2.4 Hydrogeology

Groundwater beneath the site is anticipated to be present in an unconfined aquifer within fill or alluvial/estuarine deposits. Groundwater is expected to be less than 3m below ground surface (bgs). Groundwater flow direction is anticipated to follow the surface topography and flow to the south south-east and discharge into the Hunter River located approximately 820m south to south-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 fifty 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. Thirty-four bores were found to the north of the site within the Port Waratah Coal Services land. None of these 34 bores had information available, and so have not been included in Table 2.4 below.

Table 2.4 – Summary of Registered Groundwater Bore Information

Bore ID	Installation Date	Purpose	Approx. Distance and Gradient from Site	Water Bearing Zones (mbgs)
GW202649	13/05/2009	Monitoring bore	Approx. 350m E	4.45
GW202650	13/05/2009	Monitoring bore	Approx. 350m E	4.20
GW202654	20/08/2009	Monitoring bore	Approx. 475m E	6.60
GW202657	19/07/1996	Monitoring bore	Approx. 160m NW	2.60 8.20
GW202658	19/07/1996	Monitoring bore	Approx. 160m NW	2.20
GW202795	29/10/2012	Monitoring bore	Approx. 400m SE	2.80-7.00
GW202982	19/08/2014	Monitoring bore	Approx. 305 SW	2.00-6.20
GW202983	13/09/2014	Monitoring bore	Approx. 250m S	2.00-8.00
GW202984	13/09/2014	Monitoring bore	Approx. 265m S	2.00-8.00
GW202988	13/08/2012	Monitoring bore	Approx. 350m E	5.95
GW202989	13/08/2012	Monitoring bore	Approx. 350m E	6.50

Bore ID	Installation Date	Purpose	Approx. Distance and Gradient from Site	Water Bearing Zones (mbgs)
GW202990	14/08/2020	Monitoring bore	Approx. 350m E	5.65
GW202991	14/08/2012	Monitoring bore	Approx. 350m E	5.95
GW202992	14/08/2012	Monitoring bore	Approx. 350m E	5.95
GW202993	14/08/2012	Monitoring bore	Approx. 350m E	6.45
GW202994	14/08/2012	Monitoring bore	Approx. 350m E	6.00
GW203212	12/09/2014	Monitoring bore	Approx. 242m S	2.00-4.00

Note: NK – not known; N – North, E – East, S – South, W – West

2.5 Acid Sulfate Soils

Reference to the Acid Sulfate Soil Risk Mapping for Lower Hunter Catchment (1:25,000 scale, 2008 Edition 3) indicates that the site is located within an area of "disturbed terrain".

Qualtest completed an Acid Sulfate Soil Assessment in conjunction with the PCA assessment. Based on the field observations, and the laboratory results, the estuarine/alluvial sands and clays below fill material (from about 1.5m bgs) were assessed to comprise Acid Sulfate Soils and a management plan was developed for the site, refer to NEW20P-0171-AC, dated 8 February 2021.

3.0 Site History Review

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

- A review of historical ownership of the site (Lot 152 DP1202468);
- A review of aerial photography from the past 65 years;
- A review of Section 10.7 Certificate from Newcastle City Council;
- Search of the NSW EPA's list of contaminated sites applying to the site and nearby properties; and
- A site walkover to help identify current and previous activities carried out on the site, identify surrounding land uses, and assess Areas of Environmental Concern (AECs) and Chemicals of Potential Concern (COPCs).

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

3.1 Historical Titles Search

A search of historical titles for Lot 152 DP 1202468 was undertaken by Advanced Legal Searchers Pty Ltd.

A list of past registered proprietors for Lot 152 dating back to 1914, was obtained. The results of the search are included in Appendix D and presented below in Table 3.1.

Table 3.1: Summary of Historical Titles

Date	Owner
Lot 152 DP 1202468	
2014 – to date	Port of Newcastle Lessor Pty Limited
2007 – 2014	Newcastle Port Corporation
2007 – 2007	State Property Authority
2000 – 2007	Minister for Public Works & Services
1914 – 2000	Minister for Public Works
Prior – 1914	Crown Land

The historical title search indicated that the site was Crown Land prior to 1914. Between 1914 and 2007 the land was owned by NSW government agencies related to public works and property. Since 2007 the site has been owned by Port of Newcastle entities. In 2014 the Port of Newcastle was leased by the NSW Government and at that time Port of Newcastle Lessor Pty Ltd were noted on the land title.

r3.2 Aerial Photograph Review

Aerial photographs of the site from 1954, 1964, 1976, 1984 and 1993 were obtained from the Department of Finance, Innovation and Services, and satellite images from Google Earth for 2010 and 2020, were assessed by a Qualtest Environmental Scientist. The results of the aerial photograph review are summarised below in Table 3.2. The aerial photographs are presented in Appendix E.

Table 3.2: Aerial Photograph Review

Year	Site	Surrounding Land
1954	The site appears to be cleared, well maintained land, possibly associated with farming and agriculture.	The surrounding area appears to be similar to the site, with cleared well maintained land surrounding the site. Some buildings are observed to the north of the site. The Hunter River is observed to the south and east of the site.
1964	The site appears to have been stripped of vegetation, and possibly subjected to filling. An access track runs through the southern portion of the site in an east-west direction.	The surrounding area appears to have undergone vegetation clearing, particularly to the south of the site. It is possible that sand dredged from the Hunter River has been placed to the south of the site. The cleared land around south, west and east of the site appears to have been impacted by surface water flows. To the south-west of the site, land reclamation has occurred along the South Channel of the Hunter River.

Year	Site	Surrounding Land
		Most of the buildings to the north in 1954 appear to have been removed, and a road has been constructed. The land to the north of the new road appears to be vegetated with grass and trees.
1976	The site has become partially vegetated with some trees and shrubs. The site appears to be low-lying and possibly flood affected. The access track observed in the southern portion of the site has been removed.	Large scale filling has occurred to the south of the site. Road infrastructure has been developed around the site, particularly to the south and south-east. Stockton Bridge has been constructed to the east.
1984	The site has largely been cleared of vegetation, and may be subjected to filling. An access road runs along the western boundary of the site.	Large scale industrial development has taken place to support coal exportation. Coal stockpile areas have been developed to the north and north west of the site. Numerous industrial operations surround the site in each direction.
1993	The site appears similar to the previous aerial photograph. The site has become vegetated with grass, and the road along the western boundary appears to be bitumen paved.	The surrounding area appears similar to the 1984 aerial photograph, vegetation density has been increased to the immediate north of the site.
2010	The site appears similar to the 1993 aerial photograph. Most of the grass has now been stripped from the site and vehicles are parked on the site.	The surrounding area is similar to the previous photograph. Further industrial developments are present around the site. Coal stockpile zones have increased in size. Coal terminal infrastructure such as coal loaders along the Hunter River have been developed.
2020	The site appears similar to the 2010 aerial photograph, the site is now covered by gravel.	The surrounding area appears relatively unchanged. The site to the west of the site appears to be a storage facility for steel.

3.3 Site Observations

A Qualtest Environmental Scientist visited the site on 12 January 2021. Selected site photographs are presented in Appendix F. A summary of the site features is outlined below:

- The site consisted of cleared land, with an asphalt paved road in the western portion of the site running approximately north-south, and an asphalt paved crossing in the northern portion of the site running approximately east-west. Both the road and crossing areas were in good condition, with some undulations and pavement wearing along the more trafficable zones and edges of the asphalt (see Photos 1 to 3).

- The remainder of the site was covered with varying thicknesses of road base gravel material. Grass was present along the eastern boundary, and in small areas not frequently traversed by vehicles (see Photos 4 to 6).
- Slopes on the site were observed to be relatively flat, with a very slight slope down to the south.
- A semi-trailer truck bed was observed in the central portion of the site. It was unclear how long the trailer had been there for (see Photo 6).
- Steel fencing was observed bounding the site to the south and west, and barbed wire fencing is observed bounding the site to the north and east.
- Trace amounts of general rubbish were observed within the site and included timber, plastics, paper and cardboard.
- Overhead power lines were observed in the southern portion of the site.

3.4 NSW EPA Records & Environment Protection Licenses

Contaminated Land Records

A search of the NSW EPA database of notices issued under the Contaminated Land Management Act, 1997 (CLM Act) revealed there were two properties:

- BHP Kooragang - Kooragang Island Waste Facility, Off Cormorant Road - located about >2.2km south-west of the site; and,
- Orica Kooragang Island, 15 Greenleaf Road – located about 1.97km located south to south east of the site.

A search of sites that have been notified to NSW EPA as contaminated (as of 11 September 2020) was also carried out. The search identified eight properties within the Kooragang suburb which had been notified to the NSW EPA as being contaminated. These properties were:

- NPC Berths 2 and 3, off Heron Road, Kooragang. Approximately 1.57km south-east of the site (Regulation under the CLM not required);
- Kooragang Island Waste Facility, Off Cormorant Road - located about 2.2km west of the site (Contamination currently regulated under POEO Act);
- Orica Kooragang Island, 15 Greenleaf Road – located about 1km located south-east of the site (Contamination currently regulated under CLM Act);
- Former Boral Timber Export Facility, 16 Heron Road –located about 2.0km south of the site (Regulation under the CLM not required);
- Cleanaway Technical Services, 19 Egret Street – located about 690m of south west of the site (Regulation under the CLM not required);
- Industrial Facility, 39 Heron Road – located about 1.44km south-east of the site (under assessment);
- Vacant Land, Raven Street and Cormorant Road - located about 400 metres south of the site (Regulation under the CLM not required); and,
- Linx Logistics, 240 Cormorant Road - located about 710m north to north east of the site (Regulation under the CLM not required). .

The two properties that NSW EPA considered required regulation under the CLM Act were located at least 2km up-gradient and 1km down-gradient of the site. The NSW EPA assessed that the other sites did not require regulation under the CLM Act, or were under assessment. Given the distances from the site to the notified contaminated sites, there was a low potential for contamination to impact the site.

A copy of the above searches is provided in Appendix G.

Penalty Notices

The Protection of the Environment Operations (POEO) register under Section 308 of the POEO Act 1997, was searched for Penalty Notices for the suburb of Kooragang, NSW. The search revealed 36 Penalty Notices (current and former). Three properties with Penalty Notices were located within 500m of the site:

- Cargill Australia Pty Ltd (PN 3085774863 and 3085774872) 51 Raven St, Kooragang, located immediately to the south from the southern boundary of the site. Penalty: "*Pollute waters – Corporation*" and "*Contravene any condition of licence - not noise – corporation*".
- Port Waratah Coal Services Ltd (PN 3085774277 and 3173527776) Curlew St Kooragang, 60m east from the eastern boundary of the site. Penalty: "*Pollute waters – Corporation;*
- Ventia Utility Services Pty Ltd (3085773671) Raven St, Kooragang, location from the site unknown. Penalty: "Pollute waters – Corporation".

Environment Protection Licenses (EPLs)

The Protection of the Environment Operations (POEO) register under Section 308 of the POEO Act 1997, was searched for Environment Protection Licenses (EPLs) for the suburb of Kooragang, NSW. The search revealed 36 current and/or former EPLs. Seven properties with EPLs were located within 700m of the site:

Company Name	**Address**	**Approx. Distance & Direction from Site**	**Licensed Activity**
BOC Limited	9 Egret Street	550m south-west from the southern boundary of the site	Chemical production Chemical storage
Cargill Australia Pty Ltd	51 Raven Street	30m south from the southern boundary of the site	Agricultural processing Shipping in bulk
Cleanaway Operations Pty Ltd	Raven Street	230m west-southwest from southern boundary of the site	Contaminated soil treatment Waste processing (non-thermal treatment) Waste storage
Cleanaway Pty Ltd	19 Egret Street	690m south-west of the site	Waste storage
Med-X Pty Ltd	25 Sandpiper Close	560m south-east of the site	Waste processing (non-thermal treatment) Waste storage
Newcastle Woodchipping Pty Ltd	6 Sandpiper Close	320m south-east of the site	Wood or timber milling
Port Waratah Coal Services Ltd	Curlew Street	Immediately north and east of the site	Shipping in bulk

Company Name	Address	Approx. Distance & Direction from Site	Licensed Activity
			Coal works Waste disposal by application to land Waste storage Waste processing (non-thermal treatment) Water based extractive activity

Given the proximity to the site of several EPLs which license heavy industrial uses, it is considered that there is a low potential that contamination from the properties could impact the site.

A copy of the above searches is provided in Appendix G.

NSW EPA PFAS Investigation Program

Based on a review of the NSW EPA Government PFAS Investigation Program (ref: https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program), there are no properties in the suburb of Kooragang that have been identified as a site that is likely to have used large quantities of PFAS.

NSW EPA Former Gasworks Sites

Based on a review of the NSW EPA website (ref: https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/former-gasworks-sites), no former gasworks have been identified in the suburb of Kooragang.

3.5 Anecdotal Information

No one was available to provide information on the site's history.

3.6 Section 10.7 Certificate

A Section 10.7 Certificate for the site was obtained from Newcastle City Council, and is presented in Appendix H. Relevant information is summarised below.

Table 3.3 - Summary of Section 10.7 Certificate for Lot 152 DP1202468

Zoning	SP1 Special Activities
Critical Habitat	*The land does not identify as including or comprising critical habitat.*
Heritage	*The land IS NOT AFFECTED by a listing on the state Heritage Register or an Interim Heritage Order that is in force under the heritage ACT 1997*
Mine Subsidence	*The land IS NOT WITHIN a Mine Subsidence District Declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.*
Bushfire	*Except as stated below, the land is not affected by a policy referred to in Item 7 of Schedule 4 of the Environmental Planning and Assessment Regulation 2000 that restricts the development of the land because of the likelihood of bushfire.*
Loose-fill Asbestos Insulation	*CN HAS NOT been notified that the land includes any residential premises (within the meaning of division 1A of part 8 of the home building act1989) that are listed on the register of loose-fill asbestos insulation, that is required to be maintained under that division.*
Contaminated Land Information	*Note: There are no matters prescribed by section 59(2) of the Contaminated Land Management Act 1997 to be disclosed, however if other contamination information is held by the Council this may be provided under a section 10.7(5) certificate.*
Potential acid sulfate soils	*Works carried out on the land must be undertaken in accordance with Clause 6.1 Acid sulfate soils of the Newcastle Local Environmental Plan 2012.*

3.7 Previous Reports

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

3.8 Summary of Site History

The assessed uses of the site, based on the site history review, have been summarised below in approximate chronological order:

- The site was Crown Land, and likely undeveloped until the 1950s to 1960s. The land was observed to be cleared in the 1954 aerial photograph, and potentially used for grazing stock, it is not known when the land was cleared.
- The site was subjected to filling, along with the broader Kooragang area, in the 1960s and 1980s. Based on our experience and knowledge of the area, the fill was likely sourced from dredging of the Hunter River. There is a low potential for fill material to have been sourced

from the former BHP Steelworks in Mayfield. Based on the observations during drilling, the material appears to predominately comprise dredged sand from the Hunter River.

- Sometime between 1984 and 1993 the asphalt road was constructed on the western boundary, and the remainder of the site was gravel paved between 1993 and 2010.
- The site is currently surrounded by industrial properties, many of which have Environmental Protection Licenses (EPL) for their activities, the nearest being Port Waratah Coal Services. The EPL would set limits for potential off site impacts including surface water and air quality (e.g. dust).
- Numerous sites in Kooragang have been notified to the NSW EPA as contaminated under Section 60 of the Contaminated Land Management Act 1997. However, given the distance of these properties from the site, it is considered a low potential for contamination to have migrated onto the site from these properties.

3.9 Potential Offsite Sources of Contamination

The surrounding land uses comprise heavy industry, including coal related industry, seed oil processing, and waste storage. Based on these surrounding land uses, there is a potential for offsite sources of contamination, though some immediate premises are controlled by an EPL that monitors surface water discharges and air quality.

3.10 Gaps in the Site History

Whilst the site history is reasonably comprehensive there are some gaps identified in the review as follows:

- The exact origin and quality of material used to fill the site is not known;
- Activities carried out on the site post agricultural use (if any), are not well known.

3.11 Areas of Environmental Concern

Table 3.11 (below) shows the areas of environmental concern (AECs) and associated Chemicals of Potential Concern (COPCs) identified for the site.

Table 3.11 – Areas of Environmental Concern and Chemicals of Potential Concern

AEC	Potentially Contaminating Activity	Potential COCs	Likelihood of Contamination
1. Imported Fill.	Potential use of contaminated imported fill.	TRH, BTEX, PAH, Metals, Asbestos	Low to medium
2. Surrounding industrial land uses and potential off site impacts.	Potential for contaminated surface water and groundwater to migrate onto the site; Potential for contaminated dust, particularly coal, to migrate onto the site.	TRH, BTEX, PAH, Metals	Low

4.0 Data Quality Objectives

4.1 Step 1 – State the Problem

Potential contamination of soil, surface water and/or groundwater from past filling, landuse and surrounding industrial land.

Two AECs have been identified for the site:

1. Imported Fill across site - Potential use of contaminated imported fill.
2. Surrounding industrial land uses - Potential for contaminated groundwater to migrate onto the site; and Potential for contaminated dust, particularly coal, to migrate onto the site

4.2 Step 2 – Identify the Decisions

The decisions to be made based on the Preliminary Contamination Assessment (site history review, site observations and limited sampling & analysis) are:

- Will the site require a detailed contamination assessment; and
- 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?

4.3 Step 3 – Identify the Inputs to the Decisions

Inputs into the decision are:

- Have samples been collected in the required areas of the site (the identified AECs)?
- 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 (PID);
- Laboratory results (concentrations of contaminants in soil);
- QA/QC documentation and data;
- Adopted assessment criteria (see Section 6); and,
- Relevant NSW EPA endorsed Guidelines.

Based on the preliminary nature of the investigation, the media to be sampled and analysed is:

- Soil.

Due to preliminary nature of assessment groundwater samples were not collected.

4.4 Step 4 – Define the Study Boundaries

The study boundary is defined laterally as the site boundary, Lot 152 DP1202468, within the Newcastle local government area, Parish of Newcastle, County of Northumberland. The site is located at 70 Raven Street, Kooragang, NSW and covers an area of approximately 1.05ha (refer to Figure 1 and Figure 2, Appendix A). Vertically, the study boundary will be defined by the depth of soil contamination and/or depth to groundwater. It is anticipated the vertical boundary would be a maximum of 5m bgs.

4.5 Step 5 – Develop a Decision Rule

Chemicals of Potential Concern (COPCs) are identified in Section 3.11, above. The COPCs and the associated assessment criteria are listed in Section 6 below.

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; and
- 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. This is provided samples have been collected at the required frequencies (as per NSW EPA guidelines) and adequately represent the conditions on site, if not, additional sampling may be required.

4.6 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 (including sampling frequency);
- 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:
    - 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.

4.7 Step 7 – Optimise the Design for Obtaining Data

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

- Working closely with the analytical laboratories and sampling equipment suppliers so that appropriate 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.

5.0 Field and Laboratory Investigations

5.1 Sampling Plan

The site is about 1.05ha in area. The NSW EPA (1995) Sampling Design Guidelines recommend a minimum of 21 sample locations to characterise a site of 1.05ha. To provide a preliminary assessment four sampling locations were carried out in the eastern portion of the site.

The sampling locations are shown on Figure 3, Appendix A.

5.2 Soil Sampling

Four boreholes (BH01 to BH04) were drilled in the eastern portion of the site. The boreholes were drilled to approximate maximum depths of between 2.2m and 4.1m bgs using a drill rig.

Soil samples were collected from the boreholes in the fill materials and underlying natural materials. The samples were collected using a split spoon sampler (SPT) and a clean pair of nitrile gloves per sample.

The soil samples were placed into 250mL laboratory supplied glass jars and zip locked bags for laboratory analysis. Each soil sample was placed directly into an ice-chilled esky and remained chilled during fieldwork and transportation to the laboratory.

5.3 Laboratory analysis

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

Nine soil samples were selected for analysis based on field observations. The soil samples were analysed for the following:

- Total Recoverable Hydrocarbons (TRH) – 9 primary samples;
- Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) – 9 primary samples;
- Polycyclic Aromatic Hydrocarbons (PAHs) – 9 primary samples;
- Metals (arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury) – 9 primary samples;
- Asbestos (presence/absence) – 4 primary soil samples; and,

One duplicate sample was also analysed for heavy metals, TRH, BTEX and PAHs for quality control purposes.

6.0 Investigation Criteria

6.1 Health and Ecological Levels (Soil)

The health and ecological investigation levels for soil, presented in the *National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), NEPC 2013*, Canberra

(referred to as ASC NEPM 2013) are generally used in NSW when selecting investigation levels for chemical contaminants in soil.

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

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

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

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

The HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via inhalation and direct contact with soil and groundwater. The HSLs depend on specific soil physicochemical properties, building configurations, land use scenarios and the depth that groundwater is encountered.

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

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

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

Based on the proposed site use the investigation and screening levels for commercial/industrial land use have been adopted, and are shown in Table 1, Appendix B.

6.2 Management Limits

The ASC NEPM (2013) provides management limits for petroleum hydrocarbons. The purpose of the Management Limits is to 'avoid or minimise' potential effects of petroleum hydrocarbons. ASC NEPM (1999, amended 2013) Schedule B(1) provides these as effects as:

- Formation of observable Light Non-Aqueous Phase Liquid (LNAPL);
- Fire and explosive hazards; and,
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services by hydrocarbons.

Management limits were derived by Canada-Wide Standard for Petroleum Hydrocarbons (CWS-PHC) in Soil (2008) where the lowest limiting value for each effect became the

Recommended Management Limit. Based on site specific information, the applicability of management limits as soil investigation levels for the site was reviewed, and is discussed further in Table 6.1 below.

Table 6.2 discusses the derivation of the revised management limits. These management limits will be applied to soils. As described in the ASC NEPM (2013) the magnitude of an exceedance will be considered in the context of whether the exposure pathways are plausible and whether exposure will result in harm. Depending on the level of the exceedance further qualitative or quantitative risk assessment may be required.

Table 6.2 - Site Specific Applicability of Management Limits

TRH Fraction	**Basis of Recommended Management Limits (coarse soils)**	**Appropriateness of Recommended Management Limits for Adopted Criteria**
F1 (C6-C10)	Formation of free phase NAPL *700mg/kg* Effects on Workers in Trenches *1,000mg/kg* Fire/Explosion Risk *1,400mg/kg*	The limiting value of **700mg/kg** for formation of free phase NAPL is considered appropriate. The value for effects on workers is not considered relevant as HSLs have been derived for Australian conditions and considered to be more appropriate.
F2 (C10-C16)	Effects on Workers in Trenches *1,000mg/kg* Formation of free-phase *Total F1 to F3 10,000mg/kg* Fire/Explosion Risk *5,200mg/kg*	'Effects on Workers in Trenches' is not appropriate for adoption as a criteria. These values are based on occupational exposure limits for gasoline and jet fuel, as there is no relevant acute toxicity endpoints available. CRC Care (2011) has established HSLs for 'Intrusive Maintenance Worker' for both vapour intrusion and direct contact of 'Not Limiting' and 20,000mg/kg respectively. HSLs are considered more appropriate for Australian conditions and the robustness in which they are derived. The limiting value of **5,200mg/kg** for explosion risk to intrusive maintenance workers is considered appropriate.
F3 (C16-C34)	Effectiveness of bioremediation *3,500mg/kg* Formation of free phase NAPL *Total F1 to F3 10,000mg/kg*	'Effectiveness of bioremediation' is not appropriate as a validation criteria, rather more of a guide for assessing whether bioremediation may be a viable option. It should be noted that this criterion was developed based on Canadian conditions, where bioremediation may not be as accelerated compared to the generally warmer Australian climate.

TRH Fraction	Basis of Recommended Management Limits (coarse soils)	Appropriateness of Recommended Management Limits for Adopted Criteria
		The limiting value of **10,000mg/kg** for formation of free phase NAPL is considered appropriate.
F4 (C34-C40)	Formation of free phase NAPL 10,000mg/kg	The limiting value of **10,000mg/kg** for formation of free phase NAPL is considered appropriate.

The adopted management limits are shown in Table 1, Appendix B.

6.4 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 land use 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 in soil under various land use scenarios, are shown in Table 6.3.

It is noted that Qualtest have carried out asbestos sampling and analysis on a "present/absent" basis, and therefore the guidelines above are not practical to apply. Therefore, a guideline of "detected" has been adopted.

Table 6.3 Health Screening Levels for Asbestos contamination in soil (NEPM 2013)

Form of Asbestos	Health Screening Level
	HIL A
Bonded ACM (%)	0.01
FA and AF (%)	0.001
All forms of Asbestos	No visible asbestos for surface soil (top 10cm)

7.0 Quality Assurance/Quality Control

Sampling activities were undertaken in accordance with normal, industry accepted practices and standards. 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 J.

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

QC Sample	Type	Lab	Analysis
D.12.01.21	Duplicate of BH01 0.0-0.1	Eurofins mgt	TRH, BTEX, PAH, Metals

Primary and intra lab duplicate samples were analysed by the NATA-accredited Eurofins mgt laboratory.

Table 2, Appendix B, presents the relative percentage differences (RPDs) between the primary and duplicate samples. A review of the Qualtest QA / QC results indicates that RPDs were within the acceptable range. It is noted that low concentrations can exaggerate the percentage differences with respect to small total concentrations, therefore where results for primary and duplicate sample were less than 10 time the LOR, the RPDs have been disregarded.

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

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

Based on the above, and the data validation report in Appendix J, 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.

8.0 Results

8.1 Subsurface Conditions

The soils observed during test pitting are summarised below in Table 8.1. The borehole logs are presented in Appendix I.

Table 8.1 – Summary of Geotechnical Units and Soil Types

Unit	Soil Type	Description	Depth Range (m bgs)
1A	ASPHALT (BH03 only)	Asphalt	0.0 to 0.25
1B	FILL	Sandy GRAVEL– fine to medium grained, pale grey to brown, fine to medium grained sand, trace fines of low plasticity. SILT – low plasticity, white to pale grey, with some crystalline material, possibly gypsum. SAND – fine to medium grained, pale brown to yellow/brown, brown, grey to dark grey, with shells, trace glass. Clayey Sandy GRAVEL – fine to medium grained, brown to grey/brown, fine to coarse grained sand, fines of low to medium plasticity. Gravelly SAND – fine to medium grains, brown fine grained gravel. CLAY – medium to high plasticity brown to dark brown.	0.0 to 2.0
2	Estuarine Soils	Sandy CLAY – medium to high plasticity, grey to dark grey. Silty Sandy CLAY – medium to high plasticity, grey to dark grey, fine to medium grained sand. Clayey SAND – fine to medium grained, grey to dark grey, fines of low plasticity.	1.4 to EOH*
3	Alluvial Soils	SAND – fine to medium grained, grey with shells.	1.6 to EOH*

* End of hole

Anthropogenic materials (glass) were observed within fill material at BH01. A crystalline material, assumed to be gypsum was also observed in fill at BH02 to BH03.

Groundwater inflows were observed between 2.1 and 3.0m bgs.

No odours were observed during sampling.

8.2 Laboratory Results

Soil analytical results for the contamination assessment are summarised in Table 1, Appendix B. The laboratory analytical reports are also included in Appendix K.

The soil laboratory results were compared to the investigation levels described in Sections 6. The analytical results indicated that concentrations of contaminants were reported below the adopted criteria, and asbestos was not detected.

9.0 Preliminary Conceptual Site Model

Based on the results of the preliminary contamination assessment carried out on the site, a preliminary Conceptual Site Model (CSM) has been developed.

Table 4.1 – Preliminary Conceptual Site Model

AEC	COPC	Likelihood of Contamination	Mechanism of Contamination	Potentially Affected Media	Human & Ecological Receptors	Potential mechanisms of exposure	Potential & Complete Exposure Pathways	Comments
1. Imported Fill: • Potential use of contaminated imported fill.	TRH, BTEX, PAH, Metals, Asbestos	Low to medium	• Top-down and to depth of fill • Leaching of contaminants from fill into underlying soils • Leaching of soil contaminants to groundwater	• Fill soils • Underlying soils • Surface water • Groundwater	• Current site visitors • Future construction workers & site users • Offsite groundwater discharge point – Hunter River located approximately 820m to the south to south-east of the site.	• Direct dermal contact with contaminated soil and/or groundwater • Ingestion of contaminated soil and/or groundwater • Inhalation of asbestos fibres, or contaminated soil (as dust) • Inhalation of petroleum hydrocarbon vapours • Leaching of soil contaminants to groundwater • Groundwater discharge from onsite to offsite Hunter River. Direct dermal contact with contaminated soil and/or surface water	• Complete exposure pathway for current site visitors, future construction workers and site users (if contaminated and not remediated/ managed). • Potentially incomplete exposure pathway for offsite surface water, due to groundwater discharging to surface water greater than 800m from the site. • Complete exposure pathway for groundwater, due to sandy soils and shallow depth of groundwater (if contaminated and not remediated/managed).	Exposure pathway currently potentially incomplete for soil as preliminary soil sampling results were reported below adopted guidelines. Additional sampling and analysis to sufficiently characterise the fill would be required to confirm the exposure pathway is incomplete.
2. Surrounding industrial land uses: • Potential for contaminated groundwater to migrate onto the site; • Potential for contaminated dust, particularly coal, to migrate onto the site.	TRH, BTEX, PAH, Metals	Low	• Top-down settlement of dust on site surface. • Migration of contaminated groundwater onto site.	• Surface soils • Surface water • Groundwater • Dust	• Current site visitors • Future construction workers & site users • Offsite groundwater discharge point – Hunter River located approximately 820m to the south to south-east of the site.	• Direct dermal contact with contaminated soil and/or groundwater • Ingestion of contaminated soil and/or groundwater • Inhalation of contaminated soil (as dust) • Inhalation of petroleum hydrocarbon vapours • Leaching of soil contaminants to groundwater • Groundwater discharge from onsite to offsite Hunter River.	• Complete exposure pathway for current site visitors, future construction workers and site users (if contaminated and not remediated/ managed). • Potentially incomplete exposure pathway for offsite surface water, due to groundwater discharging to surface water greater than 800m from the site. • Complete exposure pathway for groundwater, due to sandy soils and shallow depth of groundwater (if contaminated and not remediated/managed).	Exposure pathways would be incomplete if soils and groundwater are found to not be contaminated via sampling & analysis.

10.0 Conclusions and Recommendations

The site history review showed the site had been undeveloped, potentially stock grazing land until the 1950s to 1960s. In the 1960s and 1980s the site was subjected to filling, likely with dredged material from the Hunter River. From the 1990s the site has been used for vehicle traffic from Raven Street (south) to Port Waratah Coal Services (north), with asphalt paved roads and gravel hardstand being constructed. The site is surrounded by industrial properties on each side.

Two Areas of Environmental Concern (AECs) were identified based on the site history and site observations. The AECs related to: importation of fill; and potential impact from surrounding industrial land uses (including coal services, seed oil processing, metal storage, and waste management).

To provide a preliminary assessment, four sampling locations were carried out across the eastern portion of the site (area of proposed warehouse development). The laboratory results reported concentrations of contaminants below the adopted criteria. Due to the limited sampling carried out, the site was not considered to have been characterised in accordance with NSW EPA (1994) Sampling Design Guidelines.

The Preliminary Conceptual Site Model (CSM) indicated that should soil and/or groundwater contamination exist on the site, then a potential exposure pathway could exist to current and future site users, construction/maintenance workers and the environment.

Based on the site history and observations during field investigations, it is recommended that additional assessment, comprising additional intrusive investigations in the area of proposed building envelope (5,800m^2) in eastern portion of the site, be carried out in accordance with NSW EPA guidelines.

The investigation should include, but not be limited to:

- Additional soil sampling of the fill and underlying natural soils and groundwater;
- Laboratory analysis for a suite of Chemicals of Potential Concern (CPOC); and
- Reporting of the results in a Detailed Contamination Assessment (DCA).

It is noted that current groundwater information may be available for review from existing wells surrounding the site. Provided that the data showed no contamination potentially entering the site from the surrounding area (particularly Port Waratah Coal Services, located up gradient of the site), onsite groundwater investigation and sampling may not be required.

Qualtest completed an Acid Sulfate Soil Assessment in conjunction with the PCA assessment. Based on the field observations, and the laboratory results, the estuarine/alluvial sands and clays below fill material (from about 1.5m bgs) were assessed to comprise Acid Sulfate Soils and a management plan was developed for the site, refer to NEW20P-0171-AC, dated 8 February 2021.

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).

11.0 Limitations

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

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

12.0 References

NSW Department of Primary Industries (Office of Water) Registered Groundwater Bore Map, accessed from http://allwaterdata.water.nsw.gov.au/water.stm, accessed on 28 October 2020.

NSW Land and Property Information, Spatial Information eXchange (SIX) Maps - Topographic Map, accessed from https://maps.six.nsw.gov.au/, accessed on 28 October 2020.

Department of Environment and Climate Change (2008) Acid Sulfate Soil Risk Mapping for Part of the Lower Hunter River Catchment, 1:25,000 scale (Edition 3).

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

NEPC (2013) National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013), Canberra (ASC NEPM 2013).

Troedson A. L. & Deyssing L. (2016) Newcastle-Hunter Area 1:25,000 Coastal Quaternary Geology Map Series, Geological Survey of NSW

APPENDIX A:

Figures

Image obtained from Sixmaps (https://maps.six.nsw.gov.au/) 11 Janaury 2021

Qualtest LABORATORY (NSW) PTY LTD

Client:	EJE ARCHITECTURE PTY LTD	Drawing No:	FIGURE 1
Project:	PRELIMINARY CONTAMINATION ASSESSMENT	Project No:	NEW20P-0171-AA
Location:	70 RAVEN STREET (LOT 152 DP1202468)	Scale:	N.T.S.
Title:	SITE LOCATION PLAN	Date:	11/01/2020

LEGEND:

Site Boundary

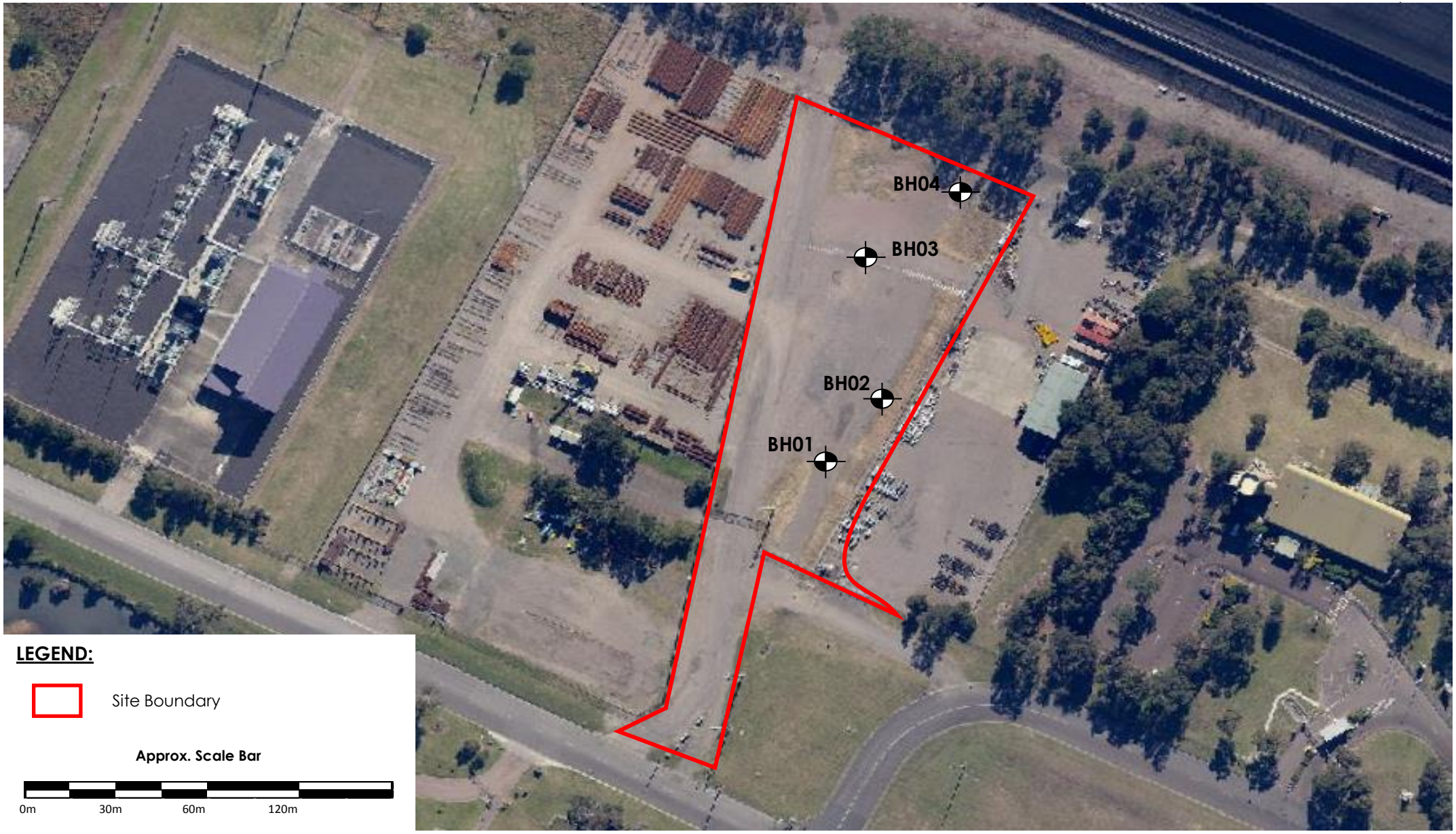
Approx. Scale Bar

0m 30m 60m 120m

Image obtained from Sixmaps (https://maps.six.nsw.gov.au/) 25 September 2020

Qualtest LABORATORY (NSW) PTY LTD

Client:	EJE ARCHITECTURE PTY LTD	Drawing No:	FIGURE 2
Project:	PRELIMINARY CONTAMINATION ASSESSMENT	Project No:	NEW20P-0171-AA
Location:	70 RAVEN STREET (LOT 152 DP1202468)	Scale:	N.T.S.
Title:	LOT LAYOUT PLAN	Date:	11/01/2021



LEGEND:

Site Boundary

Approx. Scale Bar

0m 30m 60m 120m

Image obtained from Sixmaps (https://maps.six.nsw.gov.au/) 11 Janaury 2021

Qualtest LABORATORY (NSW) PTY LTD

Client:	EJE ARCHITECTURE PTY LTD	Drawing No:	FIGURE 3
Project:	PRELIMINARY CONTAMINATION ASSESSMENT	Project No:	NEW20P-0171-AA
Location:	70 RAVEN STREET (LOT 152 DP1202468)	Scale:	N.T.S.
Title:	SAMPLING PLAN	Date:	3/02/2021

APPENDIX B:

Tables

EJE
NEW20P-0171

Table 1 - Soil Analytical Results - TRH, BTEX, PAH, Metals, Asbestos
Raven Street, Kooragang

Qualtest LABORATORY (NSW) PTY LTD

								Field ID	BH01 0.0-0.1	BH01 1.0-1.1	BH01 2.0-2.1	BH02 0.0-0.1	BH02 1.0-1.1	BH03 0.25-0.35	BH03 1.5-1.6	BH04 0.0-0.1	BH04 0.5-0.6
								Date	12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/01/2021
Analytes		**Units**	**LOR**	**HIL D [1]**	**HSL D [2]**	**EIL/ESL D [3]**	**Mgmt Limits [4]**										
Metals	Arsenic	mg/kg	2	3000		160			2.4	2.2	7.2	3.4	4.7	< 2	< 2	2.4	< 2
	Cadmium	mg/kg	0.4	900					0.6	< 0.5	< 0.5	5.3	4.1	7.4	< 0.5	0.6	< 0.5
	Chromium	mg/kg	5	3600		320*			53	< 5	49	10	16	51	14	6.5	< 5
	Copper	mg/kg	5	240000		110*			5.9	< 5	35	6.7	10	< 5	21	< 5	< 5
	Lead	mg/kg	5	1500		1800			7.9	< 5	30	14	51	10	44	7.6	5.3
	Mercury	mg/kg	5	730					0.2	< 0.1	0.1	1.7	0.2	0.3	< 0.1	0.1	< 0.1
	Nickel	mg/kg	5	6000		60*			< 5	< 5	48	< 5	10	5.7	< 5	< 5	< 5
	Zinc	mg/kg	5	400000		230*			58	16	320	56	180	21	67	28	20
PAHs	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benz(a)anthracene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5			1.4			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene TEQ (medium bound)	mg/kg	0.6	40					0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Benzo(b&j)fluoranthene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(g.h.i)perylene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenz(a.h)anthracene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Pyrene	mg/kg	0.5						< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH	mg/kg	0.5	4000					< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BTEX	Benzene	mg/kg	0.1		3	75			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1		NL	135			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1		NL	165			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3		230	180			< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
TRH	Naphthalene	mg/kg	0.5			370			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	TRH C6-C10	mg/kg	20			215	700		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C6-C10 less BTEX (F1)	mg/kg	20		260				< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH >C10-C16	mg/kg	50			170	5200		< 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			1700	10000		110	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
	TRH >C34-C40	mg/kg	100			3300	10000		< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Asbestos	Asbestos	-	-	Detected					ND	-	-	ND	-	ND	-	ND	-

Notes

* Clay content 1%, and using Ambient Background Concentration obtained from

ND Not detected

NL Not limiting

Result Concentration exceeds adopted health investigation level (Commercial/Industrial)

Result Concentration exceeds adopted health screening level, vapour intrusion (Commercial/Industrial, Sand, 0-1m)

Result Concentration exceeds the adopted ecological investigation/screening levels

Result Concentration exceeds adopted Management Limits

Result Asbestos detected

1 NEPC (2013) National Environmental Protection (Assessment of Site

2 NEPC (2013) Soil Health Screening Levels for Vapour Intrusion, Commercial/Industrial, Sand 0m to <1m

3 NEPC (2013) Soil Ecological Investigation & Screening Levels, commercial/industrial

4 NEPC (2013) Management Limits for TPH Fractions F1-F4 in Soil, adjusted as described in report

EJE
NEW20P-0171

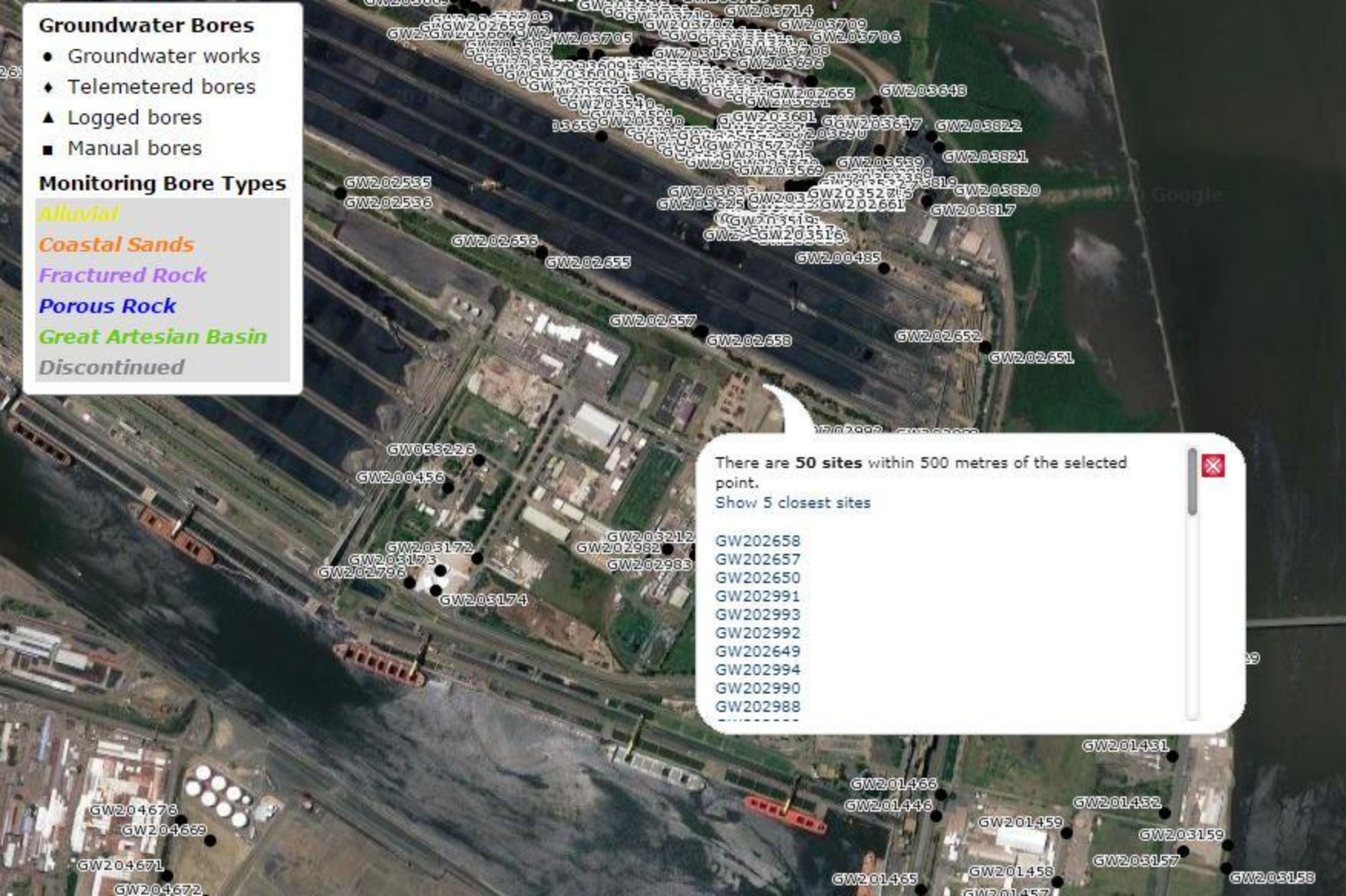
Table 2 - Quality Control Results - Duplicates
Raven Street, Kooragang

				BH01 0.0-0.1	D.12.1.21	RPD %
				12/01/2021	12/01/2021	
Analytes		**Units**	**LOR**			
Metals	Arsenic	mg/kg	2	2.4	2.8	15
	Cadmium	mg/kg	0.4	0.6	0.6	0
	Chromium	mg/kg	5	53	50	6
	Copper	mg/kg	5	5.9	6.2	5
	Lead	mg/kg	5	7.9	8.4	6
	Mercury	mg/kg	5	0.2	0.2	0
	Nickel	mg/kg	5	< 5	< 5	0
	Zinc	mg/kg	5	58	45	25
PAHs	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(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
	Benzo(k)fluoranthene	mg/kg	0.5	< 0.5	< 0.5	0
	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	< 0.5	< 0.5	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	< 0.5	0
	Total PAH	mg/kg	0.5	< 0.5	< 0.5	0
BTEX	Benzene	mg/kg	0.1	< 0.1	< 0.1	0
	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	Naphthalene	mg/kg	0.5	< 0.5	< 0.5	0
	TRH C6-C10	mg/kg	20	< 20	< 20	0
	TRH C6-C10 less BTEX (F1)	mg/kg	20	< 20	< 20	0
	TRH >C10-C16	mg/kg	50	< 50	< 50	0
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50	< 50	< 50	0
	TRH >C16-C34	mg/kg	100	110	200	58
	TRH >C34-C40	mg/kg	100	< 100	< 100	0

*RPDs have only been considered where a concentration is greater than 10 times the EQL.
**High RPDs are in bold (Acceptable RPD range is 30% (>10 x EQL))

APPENDIX C:

Groundwater Bore Search


Groundwater Bores
Groundwater works
Telemetered bores
Logged bores
Manual bores
Monitoring Bore Types
Alluvial
Coastal Sands
Fractured Rock
Porous Rock
Great Artesian Basin
Discontinued
There are 50 sites within 500 metres of the selected point.
Show 5 closest sites
GW202658
GW202657
GW202650
GW202991
GW202993
GW202992
GW202649
GW202994
GW202990
GW202988
GW202535
GW202536
GW202656
GW202655
GW202657
GW202658
GW202652
GW202651
GW053226
GW200456
GW203172
GW203173
GW202798
GW203174
GW203212
GW202982
GW202983
GW203714
GW203709
GW203707
GW203706
GW203705
GW203696
GW202665
GW203648
GW203681
GW203647
GW203822
GW203821
GW203559
GW203819
GW203820
GW203817
GW203516
GW200485
GW201431
GW201466
GW201446
GW201432
GW201459
GW203159
GW203157
GW203158
GW201458
GW201465
GW204676
GW204669
GW204671
GW204672

WaterNSW
Work Summary

GW202983

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Jetted - Water
Owner Type: Private

Commenced Date:
Completion Date: 13/09/2014
Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name: CARGILL AUSTRALIA
Driller: Andrew Forbes
Assistant Driller: Gareth Fitzgerald

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s): 15.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	2//858206
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6360995.000
Easting: 384864.000
Latitude: 32°52'59.4"S
Longitude: 151°46'08.9"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	250			Jetted - Water
1		Annulus	Cement	0.00	0.50	250	100		
1		Annulus	Waterworn/Rounded	0.50	8.00	250	100		Graded, Q:0.500m3
1	1	Casing	Pvc Class 12	0.00	6.00	100	94		Seated, Other
1	1	Opening	Slots - Horizontal	5.00	6.00	100		0	Mechanically Slotted, PVC Class 12, Other, SL: 500.0mm, A: 1.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	8.00	6.00	Unknown			15.00			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	Fill; Cement	Fill	
0.40	1.40	1.00	Silt, Sandy	Silt	

1.40	3.90	2.50	Mud; silty, Clay, dark	Mud	
3.90	4.20	0.30	Clay, silty; grey	Clay	
4.20	8.00	3.80	Mud, silty; Clay dark	Mud	

Remarks

13/09/2014: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on the Form-A.

***** End of GW202983 *****

WaterNSW
Work Summary

GW202649

Licence: 20BL173444 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow
Owner Type: Mines

Commenced Date:
Completion Date: 13/05/2009
Final Depth: 4.45 m
Drilled Depth: 4.45 m

Contractor Name: BR & M ATKINS
Driller: Brian Richard Atkins
Assistant Driller:

Property: N A Off Cormorant Rd KOORAGANG ISLAND 2304 NSW
GWMA: -
GW Zone: -
Standing Water Level (m): 1.900
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 1//775775

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361292.000
Easting: 385361.000
Latitude: 32°52'49.9"S
Longitude: 151°46'28.2"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.45	150			Auger - Hollow Flight
1		Annulus	Cement	0.00	0.20	150	58		PL:Poured/Shovelled
1		Annulus	Bentonite	0.20	0.60	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.60	4.00	150	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	1.00	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	1.00	4.00	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	4.45	4.45	Unknown	1.90					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	Topsoil/Fill; generally brown fien to medium	Topsoil	

			slightly silty sand, with abundant rootlets 0.1m		
0.15	0.75	0.60	Fill; brown fine to medium sand, with trace to some silt, damp	Fill	
0.75	1.60	0.85	Fill; light brown, fine to medium sand, with trace shells, damp to moist	Fill	
1.60	1.90	0.30	Fill; as abov, from about 1.6m wet	Fill	
1.90	2.30	0.40	Fill; as above, from 1.9m saturated	Fill	
2.30	4.45	2.15	Fill; as above, from 2.3m, trace to some fine to medium subangular gravel & shells	Fill	

Remarks

13/05/2009: Form A Remarks:
Nat Carling, 15-Feb-2013; All details were provided by client/consultant retrospectively.

***** End of GW202649 *****

WaterNSW
Work Summary

GW202650

Licence: | **Licence Status:**

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow
Owner Type: Mines

Commenced Date:
Completion Date: 13/05/2009
Final Depth: 4.20 m
Drilled Depth: 4.20 m

Contractor Name: BR & M ATKINS
Driller: Brian Richard Atkins
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 2.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361293.000
Easting: 385350.000
Latitude: 32°52'49.9"S
Longitude: 151°46'27.8"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.20	150			Auger - Hollow Flight
1		Annulus	Cement	0.00	0.25	150	58		PL:Poured/Shovelled
1		Annulus	Bentonite	0.25	0.60	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.60	4.00	150	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	1.00	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	1.00	4.00	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	4.20	4.20	Unknown	2.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	Topsoil/Fill; brown fine to medium grained,	Topsoil	

			slightly silty sand, with abundant rootlets to 0.10m		
0.15	0.80	0.65	Fill; generally brown fine to medium sand, with trace to some silt, damp	Fill	
0.80	1.60	0.80	Fill; generally dense light brown fine to medium sand, with trace fine to mediumg rained (up to 15mm) & trace shells, da	Fill	
1.60	2.00	0.40	Fill; as above, from 1.8m, moist to wet	Fill	
2.00	4.20	2.20	Fill; as above, from approx 2m, saturated	Fill	

Remarks

13/05/2009: Form A Remarks:
Nat Carling, 15-Feb-2013; All details were provided by client/consultant retrospectively.

***** End of GW202650 *****

WaterNSW
Work Summary

GW202984

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Jetted - Water
Owner Type: Private

Commenced Date:
Completion Date: 13/09/2014
Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name: CARGILL AUSTRALIA
Driller: Andrew Forbes
Assistant Driller: Gareth Fitzgerald

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s): 0.500

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	2//858206
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6360988.000
Easting: 384928.000
Latitude: 32°52'59.6"S
Longitude: 151°46'11.4"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	250			Jetted - Water
1		Annulus	Cement	0.00	0.50	250	100		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.50	8.00	250	100		Graded, Q:0.500m3, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	6.00	100	94		Seated, Other
1	1	Opening	Slots - Horizontal	3.00	6.00	100		0	Mechanically Slotted, PVC Class 12, Other, SL: 500.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	8.00	6.00	Unknown			0.50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	Fill; Cement	Fill	
0.40	1.40	1.00	Silt, Sandy	Silt	

1.40	3.90	2.50	Mud, silty/Clay, dark	Mud	
3.90	4.20	0.30	Clay, silty; grey	Clay	
4.20	8.00	3.80	Mud, silty/Clay, dark	Mud	

Remarks

13/09/2014: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on the Form-A.

***** End of GW202984 *****

WaterNSW
Work Summary

GW202654

Licence:
Licence Status:

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Hollow
Owner Type: Mines

Commenced Date:
Completion Date: 20/08/2009
Final Depth: 6.60 m
Drilled Depth: 7.45 m

Contractor Name: BR & M ATKINS
Driller: Brian Richard Atkins
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m): 4.500
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361172.000
Easting: 385476.000
Latitude: 32°52'53.8"S
Longitude: 151°46'32.6"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.45	140			Auger - Hollow Flight
1		Annulus	Bentonite	0.00	2.50	140	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	2.50	6.50	140	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	3.50	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	3.50	6.50	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	6.60	6.60	Unknown	4.50					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.34	0.34	Fill; brown fine to mediumg rained sand, with trace shell fragments & trace rootlets	Fill	

			to 0.03m, dry		
0.34	4.25	3.91	Fill; as above, from 3.4m, moist to wet	Fill	
4.25	4.50	0.25	Fill; as above, from 4.25m, light to dark grey	Fill	
4.50	6.60	2.10	Fill; as above, from 4.5m, saturated	Fill	
6.60	7.45	0.85	Clay; soft, dark grey	Clay	

Remarks

20/08/2009: Form A Remarks:
Nat Carling, 18-Feb-2013; All details were provided by client/consultant retrospectively.

***** End of GW202654 *****

WaterNSW
Work Summary

GW202982

Licence: 20BL173112 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status: Filled,Backfilled
Construct.Method: Jetted - Water
Owner Type: Private

Commenced Date:
Completion Date: 19/08/2014
Final Depth: 6.00 m
Drilled Depth: 6.20 m

Contractor Name: CARGILL AUSTRALIA
Driller: Andrew Forbes
Assistant Driller: Gareth Fitzgerald

Property: N A 51 Raven St KOORAGANG 2304 NSW
GWMA: -
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	2//858206
Licensed:	NORTHUMBERLAND	NEWCASTLE	Whole Lot 2//858206

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361014.000
Easting: 384793.000
Latitude: 32°52'58.7"S
Longitude: 151°46'06.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	150			Jetted - Water
1		Backfill	Clay	0.00	6.00	150			
1	1	Casing	Pvc Class 9	0.00	6.00	50	46		Seated, Other
1	1	Opening	Slots - Horizontal	0.00	6.00	50		0	Mechanically Slotted, PVC Class 18, Other, SL: 50.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	6.20	4.20	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.60	0.60	Fill; roadbase	Fill	
0.60	1.00	0.40	(Unknown); Geo Fabric, shell grit	(Unknown)	
1.00	2.40	1.40	Mud; med to dark	Mud	

2.40	3.40	1.00	Silt, Sandy	Silt	
3.40	5.90	2.50	Mud/Clay; silty, dark	Mud	
5.90	6.20	0.30	Silty	Silt	

Remarks

19/08/2014: Form A Remarks:
Nat Carling, 5-May-2015; Coordinates based on location map provided with the Form-A.

***** End of GW202982 *****

WaterNSW
Work Summary

GW202795

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 29/10/2012
Final Depth: 5.50 m
Drilled Depth: 7.45 m

Contractor Name: FICO
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	RD ADJ 14//1144748
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6360901.000
Easting: 385108.000
Latitude: 32°53'02.5"S
Longitude: 151°46'18.3"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.00	110			Auger - Solid Flight
1		Annulus	Bentonite/Grout	0.00	2.10	110	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	2.10	5.50	110	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	2.50	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	2.50	5.50	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.80	7.00	4.20	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.80	1.80	Fill	Fill	
1.80	2.70	0.90	Clay, silty sandy	Clay	

2.70	7.45	4.75	Sand	Sand	

Remarks

29/10/2012: Form A Remarks:
Nat Carling, 5-Mar-2014; GPS provided by the drillers.

***** End of GW202795 *****

WaterNSW
Work Summary

GW202657

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Mines

Commenced Date:
Completion Date: 19/07/1996
Final Depth: 8.20 m
Drilled Depth: 8.20 m

Contractor Name: McDermott Drilling
Driller: Unkown Unknown
Assistant Driller: Lance

Property:
GWMA:
GW Zone:
Standing Water Level (m): 1.400
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361582.000
Easting: 384871.000
Latitude: 32°52'40.3"S
Longitude: 151°46'09.5"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	3.10	150			Auger - Solid Flight
1		Hole	Hole	3.10	8.20	150			Rot. Rev. Circ Mud
1		Annulus	Waterworn/Rounded	0.00	2.20	150	58		Graded, PL:Poured/Shovelled
1		Annulus	Bentonite	2.20	5.00	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	5.00	8.20	150	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	5.20	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	5.20	8.20	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	2.60	2.60	Unknown	1.40					
4.00	8.20	4.20	Unknown						

Drillers Log

From	To	Thickness	Drillers Description	Geological Material	Comments

(m)	(m)	(m)			
0.00	0.20	0.20	Sand; moist, brown, loose, silty (topsoil)	Sand	
0.20	0.50	0.30	Gravel; moist, grey, dense, coarse, & Cobbles (blast furnace slag fill)	Gravel	
0.50	2.20	1.70	Sand; moist, light brown, medium grained, dense (dredged fill), wet @ 1.5m	Sand	
2.20	2.60	0.40	Clay; wet, black, loose/soft, sandy/clayey sand (alluvium)	Clay	
2.60	4.00	1.40	Clay; wet, black, fine to stiff, with a trace of sand (alluvium)	Clay	
4.00	5.20	1.20	Sand; wet, black, loose, with clay (alluvium)	Sand	
5.20	8.20	3.00	Sand; wet, light grey, fine grey, fine grained, medium dense (Alluvium)	Sand	

Remarks

19/07/1996: Form A Remarks:
Nat Carling, 18-Feb-2013; All details were provided by client/consultant retrospectively.

***** End of GW202657 *****

WaterNSW
Work Summary

GW202658

Licence: | **Licence Status:**

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Mines

Commenced Date: | **Final Depth:** 2.20 m
Completion Date: 19/07/1996 | **Drilled Depth:** 2.20 m

Contractor Name: McDermott Drilling
Driller: Unkown Unknown
Assistant Driller: Jamie

Property: | **Standing Water Level (m):**
GWMA: | **Salinity Description:**
GW Zone: | **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter | **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER | **Grid Zone:** | **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) | **Northing:** 6361582.000 | **Latitude:** 32°52'40.3"S
Elevation Source: Unknown | **Easting:** 384877.000 | **Longitude:** 151°46'09.7"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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	2.20	140			Auger - Solid Flight
1		Annulus	Crushed Aggregate	0.00	2.20	140	58		Ungraded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	0.70	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	0.70	2.20	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	2.20	2.20	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	Sand; moist, brown, loose, silty (topsoil)	Sand	
0.20	0.40	0.20	Gravel; moist, grey, dense, coarse grained,	Gravel	

			with some sand & cobbles (slag fill)		
0.40	2.20	1.80	Sand; moist, light brown, medium grained, dense (dredged fill), varying to wet ~1.4m	Sand	

Remarks

19/07/1996: Form A Remarks:
Nat Carling, 18-Feb-2013; All details were provided by client/consultant retrospectively.

***** End of GW202658 *****

WaterNSW
Work Summary

GW202988

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 13/08/2012
Final Depth: 5.50 m
Drilled Depth: 5.95 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property:
GWMA:
GW Zone:
Standing Water Level (m): 3.800
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361290.000
Easting: 385374.000
Latitude: 32°52'50.0"S
Longitude: 151°46'28.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	5.95	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.60	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.60	5.50	150	58		Graded, PL:Poured/Shovelled
1		Backfill	Drilled Cutting	5.50	5.95	150			
1	1	Casing	Pvc Class 18	0.00	0.90	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	0.90	5.50	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	5.95	5.95	Unknown	3.80					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.25	0.25	Fill; Asphalt	Fill	

0.25	3.50	3.25	Fill; generally light brown, medium grained sandy, trace shell inclusions, moist	Fill	
3.50	3.80	0.30	Fill; as above, increasing moisture	Fill	
3.80	5.35	1.55	Fill; as above, grey brown sand, trace to some shells, moist to wet	Fill	
5.35	5.95	0.60	Clay, Silty; soft, dark grey with trace sand	Clay	

Remarks

13/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A. Backfill & lithology details were taken from sketch provided on consultants log.

***** End of GW202988 *****

WaterNSW
Work Summary

GW202989

Licence: | **Licence Status:**

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date: | **Final Depth:** 6.50 m
Completion Date: 13/08/2012 | **Drilled Depth:** 6.50 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property: | **Standing Water Level (m):** 4.800
GWMA: | **Salinity Description:**
GW Zone: | **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter | **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER | **Grid Zone:** | **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) | **Northing:** 6361274.000 | **Latitude:** 32°52'50.5"S
Elevation Source: Unknown | **Easting:** 385368.000 | **Longitude:** 151°46'28.5"E

GS Map: - | **MGA Zone:** 56 | **Coordinate Source:** GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.50	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.40	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.40	6.50	150	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	0.50	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	0.50	6.50	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	6.50	6.50	Unknown	4.80					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.17	0.17	Fill; Concrete	Fill	
0.17	2.10	1.93	Fill; generally light brown, medium grained	Fill	

			sand, with trace gravel & shell inclusions, trace coal to approx 2.1m, moist		
2.10	4.00	1.90	Fill; as above, some gravel, cobbles & coal reject	Fill	
4.00	4.60	0.60	Fill; as above, grey/brown, sand filling	Fill	
4.60	4.80	0.20	Fill; as above, trace rubber	Fill	
4.80	5.50	0.70	Fill; as above, wet	Fill	
5.50	6.10	0.60	Fill; as above, loose sand	Fill	
6.10	6.40	0.30	Clay, Silty Sandy; soft, grey	Clay	
6.40	6.50	0.10	Clay, Silty; stiff, grey	Clay	

Remarks

13/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A.
Lithology details were taken from sketch provided on consultants log.

***** End of GW202989 *****

WaterNSW
Work Summary

GW202990

Licence:
Licence Status:

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 14/08/2012
Final Depth: 5.65 m
Drilled Depth: 5.65 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property:
GWMA:
GW Zone:
Standing Water Level (m): 4.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361287.000
Easting: 385369.000
Latitude: 32°52'50.1"S
Longitude: 151°46'28.5"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	5.65	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.40	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.40	5.65	150	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	0.50	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	0.50	5.65	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	5.65	5.65	Unknown	4.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.25	0.25	Fill; Asphalt	Fill	
0.25	2.50	2.25	Fill; generally light brown, medium grained	Fill	

			sandy, with trace shell inclusions, moist		
2.50	4.00	1.50	Fill; as above, from 2.5m, sand filling	Fill	
4.00	5.40	1.40	Fill; as above, from 4.0m wet grey/brown sand filling	Fill	
5.40	5.65	0.25	Clay, Silty Sandy; dark grey	Clay	

Remarks

14/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A.
Lithology details were taken from sketch provided on consultants log.

***** End of GW202990 *****

WaterNSW
Work Summary

GW202991

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 14/08/2012
Final Depth: 5.60 m
Drilled Depth: 5.95 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property:
GWMA:
GW Zone:
Standing Water Level (m): 4.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361296.000
Easting: 385359.000
Latitude: 32°52'49.8"S
Longitude: 151°46'28.1"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	5.95	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.40	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.40	5.60	150	58		Graded, PL:Poured/Shovelled
1		Backfill	Drilled Cutting	5.60	5.95	150			
1	1	Casing	Pvc Class 18	0.00	0.60	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	0.60	5.60	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	5.95	5.95	Unknown	4.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	Fill; generally brown, medium grained silty	Fill	

			sandy topoil with some rootlets & organics, moist		
0.15	1.10	0.95	Fill; generally light brown, medium grained sandy filling with trace shell inclusions, moist	Fill	
1.10	4.00	2.90	Fill; as above, from 1.1m to 1.15m, gravel/cobbles	Fill	
4.00	5.50	1.50	Fill; as above, from 4m grey/brown sand filling with trace shells, wet	Fill	
5.50	5.60	0.10	Clay, Silty; dark grey with trace sand	Clay	
5.60	5.95	0.35	Clay, Silty; as above, from 5.6m no sand	Clay	

Remarks

14/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A.
Lithology & backfill details were taken from sketch provided on consultants log.

***** End of GW202991 *****

WaterNSW
Work Summary

GW202992

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 14/08/2012
Final Depth: 5.60 m
Drilled Depth: 5.95 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property:
GWMA:
GW Zone:
Standing Water Level (m): 4.000
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361300.000
Easting: 385363.000
Latitude: 32°52'49.6"S
Longitude: 151°46'28.3"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	5.95	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.40	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.40	5.60	150	58		Graded, PL:Poured/Shovelled
1		Backfill	Drilled Cutting	5.60	5.95	150			
1	1	Casing	Pvc Class 18	0.00	0.60	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	0.60	5.60	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	5.95	5.95	Unknown	4.00					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.15	0.15	Fill; generally brown, medium grained silty	Fill	

			sandy topsoil filling, moist		
0.15	2.50	2.35	Fill; generally light brown, medium grained sandy filling with trace shell inclusions, moist	Fill	
2.50	4.00	1.50	Fill; as above, from 2.5 to 2.56m, trace coal ash	Fill	
4.00	5.40	1.40	Fill; as above, from 4m grey/brown sand filling, wet, @ 4.1m, some yellow concrete & shells found	Fill	
5.40	5.95	0.55	Clay, Silty; soft to firm, dark grey	Clay	

Remarks

14/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A.
Lithology & backfill details were taken from sketch provided on consultants log.

***** End of GW202992 *****

WaterNSW
Work Summary

GW202993

Licence: | **Licence Status:**

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date: | **Final Depth:** 6.20 m
Completion Date: 14/08/2012 | **Drilled Depth:** 6.45 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property: | **Standing Water Level (m):** 4.600
GWMA: | **Salinity Description:**
GW Zone: | **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter | **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER | **Grid Zone:** | **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) | **Northing:** 6361275.000 | **Latitude:** 32°52'50.4"S
Elevation Source: Unknown | **Easting:** 385349.000 | **Longitude:** 151°46'27.7"E

GS Map: - | **MGA Zone:** 56 | **Coordinate Source:** GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.45	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.60	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.60	6.20	150	58		Graded, PL:Poured/Shovelled
1		Backfill	Drilled Cutting	6.20	6.45	150			
1	1	Casing	Pvc Class 18	0.00	1.00	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	1.00	6.20	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	6.45	6.45	Unknown	4.60					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.05	0.05	Fill; generally brown silty sandy topsoil,	Fill	

			abundant organics, moist		
0.05	1.00	0.95	Fill; generally light brown, medium grained sandy filling with trace shell inclusions, moist	Fill	
1.00	2.50	1.50	Fill; as above, from 1 to 1.05m, light green & blue slag cobbles	Fill	
2.50	3.50	1.00	Fill; as above, form 2.5m, dense sand filling, at approx 2.5m, light green slag cobble	Fill	
3.50	4.60	1.10	Fill; as above, from 3.5m, slight increase in moisture	Fill	
4.60	5.50	0.90	Fill; as above, from 4.6m, wet	Fill	
5.50	6.00	0.50	Fill; as above, from 5.5m, grey/brown sand filling	Fill	
6.00	6.45	0.45	Clay, Silty; soft, dark grey, with trace shells	Clay	

Remarks

14/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A. Lithology & backfill details were taken from sketch provided on consultants log.

***** End of GW202993 *****

WaterNSW
Work Summary

GW202994

Licence: | **Licence Status:**

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date: | **Final Depth:** 6.00 m
Completion Date: 14/08/2012 | **Drilled Depth:** 6.00 m

Contractor Name: FICO Group
Driller: Daniel James Dudley
Assistant Driller: Shaun Currie

Property: | **Standing Water Level (m):** 4.500
GWMA: | **Salinity Description:**
GW Zone: | **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	1//775775
Licensed:			

Region: 20 - Hunter | **CMA Map:** 9232-2S
River Basin: 210 - HUNTER RIVER | **Grid Zone:** | **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) | **Northing:** 6361275.000 | **Latitude:** 32°52'50.5"S
Elevation Source: Unknown | **Easting:** 385358.000 | **Longitude:** 151°46'28.1"E

GS Map: - | **MGA Zone:** 56 | **Coordinate Source:** GIS - Geogra

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	150			Auger - Solid Flight
1		Annulus	Bentonite	0.00	0.60	150	58		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.60	6.00	150	58		Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	1.00	58	50		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	1.00	6.00	58		0	Mechanically Slotted, PVC Class 18, Screwed, SL: 30.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	6.00	6.00	Unknown	4.50					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.17	0.17	Fill; concrete	Fill	
0.17	0.20	0.03	Fill; generally light brown, medium grained	Fill	

			sandy filling with trace shells & gravel inclusions, moist		
0.20	4.00	3.80	Fill; as above, from 0.2m to 0.4m, abundant gravel & cobbles, max diameter 0.05mm	Fill	
4.00	5.80	1.80	Fill; as above, from 4m, blue/black slag, refusal on SPT	Fill	
5.80	6.00	0.20	Clay, Silty; dark grey	Clay	

Remarks

14/08/2012: Form A Remarks:
Nat Carling, 5-May-2015; GPS provided on Form-A was in wrong projection, coordinates based on location map provided with the Form-A. Lithology details were taken from sketch provided on consultants log.

***** End of GW202994 *****

WaterNSW
Work Summary

GW203212

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): DEWATERING (GROU

Work Type: Bore
Work Status: Abandoned,Backfilled
Construct.Method: Jetted - Water
Owner Type: Private

Commenced Date:
Completion Date: 12/09/2014
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: CARGILL AUSTRALIA
Driller: Andrew Forbes
Assistant Driller: Gareth Fitzgerald

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTHUMBERLAND	NEWCA	2//858206
Licensed:			

Region: 20 - Hunter
River Basin: 210 - HUNTER RIVER
Area/District:
CMA Map: 9232-2S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6361018.000
Easting: 384873.000
Latitude: 32°52'58.6"S
Longitude: 151°46'09.3"E

GS Map: -
MGA Zone: 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	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	250			Jetted - Water
1		Backfill	Concrete	0.00	0.40	250			
1		Backfill	Sand	0.40	6.00	250			
1		Annulus	Waterworn/Rounded	0.50	6.00	250	100		Graded, Q:0.500m3, PL:Poured/Shovelled
1	1	Casing	Pvc Class 12	0.00	6.00	100	94		Seated, Other
1	1	Opening	Slots - Horizontal	5.00	6.00	100		0	Mechanically Slotted, PVC Class 12, Other, SL: 500.0mm, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.00	6.00	4.00	Unknown						

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	Mud, mid to dark	Mud	

0.40	1.40	1.00	Silt, sandy	Silt	
1.40	3.90	2.50	Mud/Clay, silty, dark	Mud	
3.90	4.20	0.30	Mud, silty	Mud	
4.20	6.00	1.80	Mud/Clay, silty, dark	Mud	

Remarks

12/09/2014: Form A Remarks:
Nat Carling, 27-May-2015; Coordinates based on location map provided with the Form-A.

***** End of GW203212 *****

APPENDIX D:

Historical Titles

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)
ABN 82 147 943 842

18/36 Osborne Road,
Manly NSW 2095

Telephone: +612 9977 6713
Mobile: 0412 169 809
Email: search@alsearchers.com.au

30th October 2020

QUALTEST LABORATORY (NSW) PTY LTD
8 Ironbark Close,
WARABROOK NSW 2304

Attention: Stephanie Cullen

RE: **Raven Street,**
Kooragang
Purchase Order NEW20P-0EJE

Current Search

Folio Identifier 152/1202468 (title attached)
DP 1202468 (plan attached)
Dated 30th October, 2020
Registered Proprietor:
PORT OF NEWCASTLE LESSOR PTY LIMITED

Title Tree
Lot 152 DP 1202468

Folio Identifier 152/1202468

Folio Identifier 15/1144748

Folio Identifier 73/1119950

Folio Identifier 7/1015754

Folio Identifier 2/869622

Folio Identifier 12/775775

Folio Identifier 14/262783

Certificate of Title Volume 15161 Folio 64

Certificate of Title Volume 9766 Folio 190

Crown Land

(a)

PA 43438

Acquired for Wharfage Improvements etc.

Part of Moscheto Island

****

(b)

PA 43438

Acquired for Harbour Improvements etc

Government Gazette 28th July 1963

****

Summary of Proprietor(s)
Lot 152 DP 1202468

Year	Proprietor(s)
	(Lot 152 DP 1202468)
2015 – todate	Port of Newcastle Lessor Pty Limited *(ACN 165 332 981)*
(2015 – todate)	*(lease to Port of Newcastle Investments (Property) Pty Limited)*
(2015 – todate)	*(lease to Port of Newcastle (Operations) Pty Limited)*
	(Lot 15 DP 1144748)
2014 – 2015	Port of Newcastle Lessor Pty Limited *(ACN 165 332 981)*
(2014 – 2015)	*(lease to Port of Newcastle Investments (Property) Pty Limited)*
(2014 – 2015)	*(lease to Port of Newcastle (Operations) Pty Limited)*
2009 – 2014	Newcastle Port Corporation *(ACN 825 884 846)*
	(Lot 73 DP 1119950)
2007 – 2009	Newcastle Port Corporation *(ACN 825 884 846)*
	(Lot 7 DP 1015754)
2007 – 2007	State Property Authority
2000 – 2007	Minister for Public Works & Services
(2000 – 2007)	*(various leases shown on Historical Folio 7/1015754)*
	(Lot 2 DP 869622)
1997 – 2000	Minister for Public Works
	(Lot 12 DP 775775)
1988 – 1997	Minister for Public Works
	(Lot 14 DP 26273)
1984 – 1988	Minister for Public Works
	(Lot 14 DP 262783 – CTVol 15161 Fol 61)
1983 – 1984	Minister for Public Works
(1983 – 1984)	*(various commercial leases shown on CTVol 15161 Fol 61)*
	(Lots 1, 2 & 3 DP 219706 – CTVol 9766 Fol 190)
1964 – 1983	Minister for Public Works
(1967 – 1983)	*(various leases shown on CTVol 9766 Fol 190)*

See Notes (a) & (b)

Note (a)

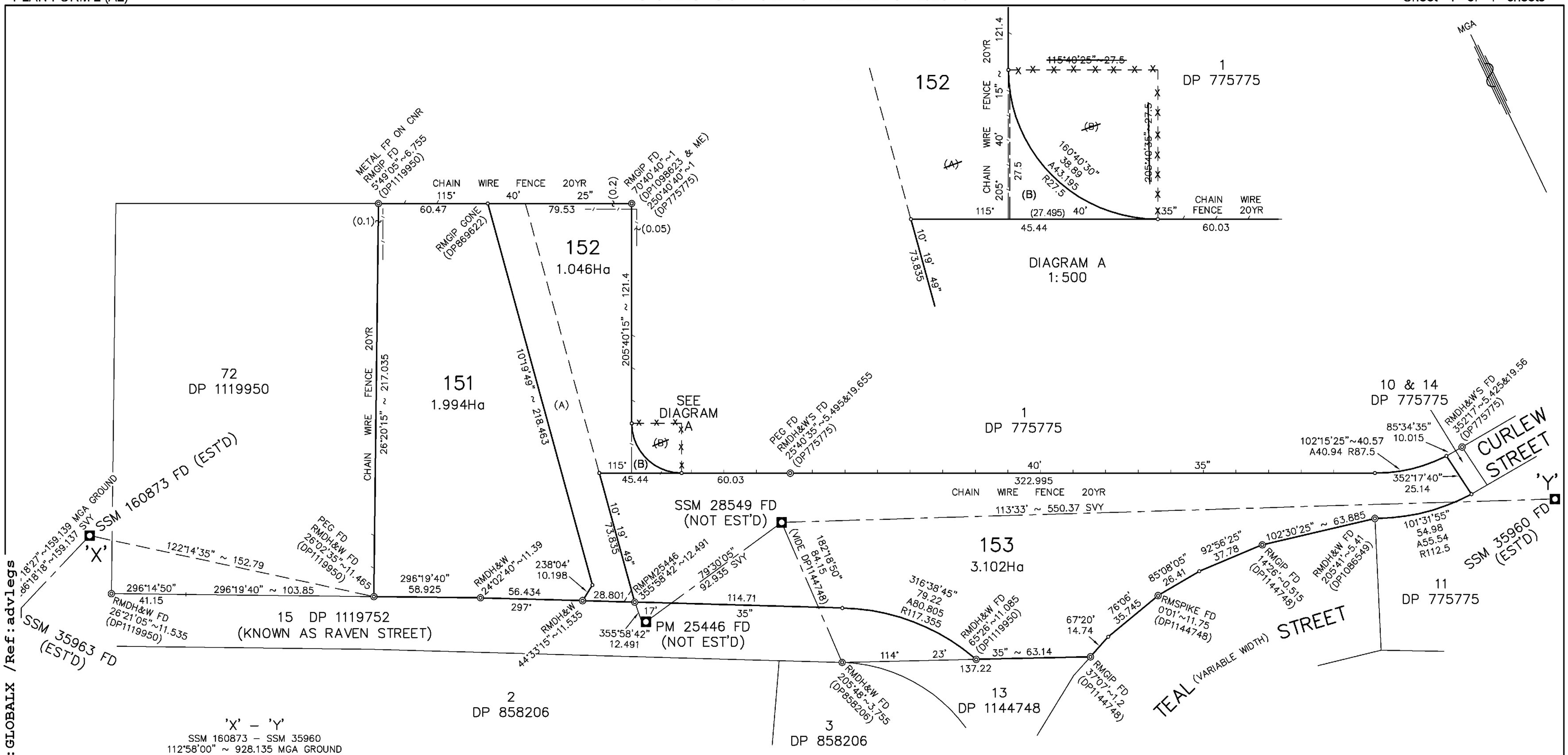
	(Various Portions Parish Newcastle – Moscheto, Dempsey and other lands)
1914 – 1964	Minister for Public Works
Prior – 1914	Crown Land *(Part of Moscheto, Dempsey and other Islands, Newcastle)*

****

Note (b)

	(Part Hunter River Parish Newcastle & other lands)
1918 – 1964	Minister for Public Works *(for Harbour Improvements)*
Prior – 1918	Crown Land

****



'X' – 'Y'
SSM 160873 – SSM 35960
112°58'00" ~ 928.135 MGA GROUND
~ 928.147 SURVEY

SSM 35963 – SSM 35960
111°59'36" ~ 1086.356 MGA GROUND
111°59'31" ~ 1086.367 SURVEY

(A) – RIGHT OF CARRIAGEWAY 20 WIDE (DP869622)

(B) – PROPOSED EASEMENT FOR MONITORING STATION VARIABLE WIDTH

SURVEYING AND SPATIAL INFORMATION REGULATION 2012 : CLAUSE 35(1)(B) & CLAUSE 61(2)

MARK	MGA COORDINATES		CLASS	ORDER	METHOD	ORIGIN
	EASTING	NORTHING				
SSM 28549	385073	6361234	U	U	–	SCIMS
SSM 35960	385577.111	6361013.698	B	2	–	SCIMS
SSM 35963	384570.057	6361420.439	A	1	–	SCIMS
SSM 160873	384722.756	6361375.765	A	2	–	SCIMS
PM 25446	384981	6361217	U	U	–	SCIMS
COMBINED SCALE FACTOR = 0.999757					ZONE 56	
SOURCE : MGA COORDINATES ADOPTED FROM SCIMS AS AT 25th SEP 2014.						

Surveyor: DAVID LUKE SULLIVAN Date of Survey: 3/10/2014 Surveyor's Ref: 09174DPM	PLAN OF SUBDIVISION OF LOT 15 DP 1144748 AND PROPOSED EASEMENT OVER LOT 1 DP 775775	LGA: NEWCASTLE Locality: KOORAGANG Subdivision No: 09174M Lengths are in metres. Reduction Ratio 1: 1500	Registered 30.10.2015	DP1202468 (E)

10 20 30 40 50 60 Table of mm 90 100 110 120 130 140

PLAN FORM 6 (2013) WARNING: Creasing or folding will lead to rejection ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 30.10.2015

Title System: TORRENS

Purpose: SUBDIVISION

Office Use Only

DP1202468 (E)

PLAN OF SUBDIVISION OF LOT 15 DP1144748 AND PROPOSED EASEMENT ~~OVER LOT 1 DP 775775~~

LGA: NEWCASTLE

Locality: KOORANGANG

Parish: NEWCASTLE

County: NORTHUMBERLAND

Crown Lands NSW/Western Lands Office Approval

I, ... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given.

Signature: .....

Date: .....

File Number: .....

Office: .....

Subdivision Certificate

I, ROBERT JOHN MONTEATH .....

*Authorised Person/~~*General Manager/*Accredited Certifier~~, certify that the provisions of s.109J of the *Environmental Planning and Assessment Act 1979* have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.

Signature: .....

Accreditation number: Reg 160A(h) of the EP&A Act.....

Consent Authority: Exempt Development Cl 16 SEPP (Three Ports)..

Date of endorsement: 7th July 2015

Subdivision Certificate number: 09174M

File number: 09-174/15

*Strike through if inapplicable.

Survey Certificate

I, DAVID LUKE SULLIVAN .....

of MONTEATH & POWYS PO BOX 726, NEWCASTLE, 2300 a surveyor registered under the *Surveying and Spatial Information Act 2002*, certify that:

*(a) The land shown in the plan was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on 3/10/2014 .....

~~*(b) The part of the land shown in the plan (*being/*excluding ^ .....) was surveyed in accordance with the *Surveying and Spatial Information Regulation 2012*, is accurate and the survey was completed on, ... the part not surveyed was compiled in accordance with that Regulation.~~

~~*(c) The land shown in this plan was compiled in accordance with the *Surveying and Spatial Information Regulation 2012*.~~

Signature: D Sullivan Dated: 7/7/2015

Surveyor ID: 8621 .....

Datum Line: X - Y .....

Type: *Urban/~~*Rural~~

The terrain is *Level-Undulating / ~~*Steep-Mountainous~~.

*Strike through if inapplicable.

^Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.

Statements of intention to dedicate public roads, create public reserves and drainage reserves, acquire/resume land.

Plans used in the preparation of survey/~~compilation~~.

DP775775
DP858206
DP1086549
DP1119950
DP1144748

If space is insufficient continue on PLAN FORM 6A

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

Surveyor's Reference: 09174DPM

PLAN HEADING AMENDED VIDE 2015-1567 23.11.2015

PLAN FORM 6A (2012) WARNING: Creasing or folding will lead to rejection ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Office Use Only

Registered: 30.10.2015

Office Use Only

DP1202468

PLAN OF SUBDIVISION OF LOT 15 DP1144748 AND PROPOSED EASEMENT ~~OVER LOT 1 DP775775~~

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2012*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Subdivision Certificate number: 09174M

Date of Endorsement: 7.7.2015

Schedule of Street Addresses

Lot	Street Number	Street Name	Street Type	Location
151	N/A	RAVEN	STREET	KOORAGANG
152	N/A	RAVEN	STREET	KOORAGANG
153	N/A	TEAL	STREET	KOORAGANG.

Executed by **PORT OF NEWCASTLE LESSOR PTY LIMITED**)
ACN 165 332 981 pursuant to)
s.127 OF THE CORPORATIONS ACT 2001 in the)
presence of:

.....
Signature of Director

.....
Signature of Director / Company Secretary

BRETT NEWMAN
.....
Name of Director (print)

ANTHONY MORGAN
.....
Name of Director / Company Secretary (print)

If space is insufficient use additional annexure sheet

Surveyor's Reference: 09174DPM

PLAN HEADING AMENDED VIDE 2015-1567 23.11.2015

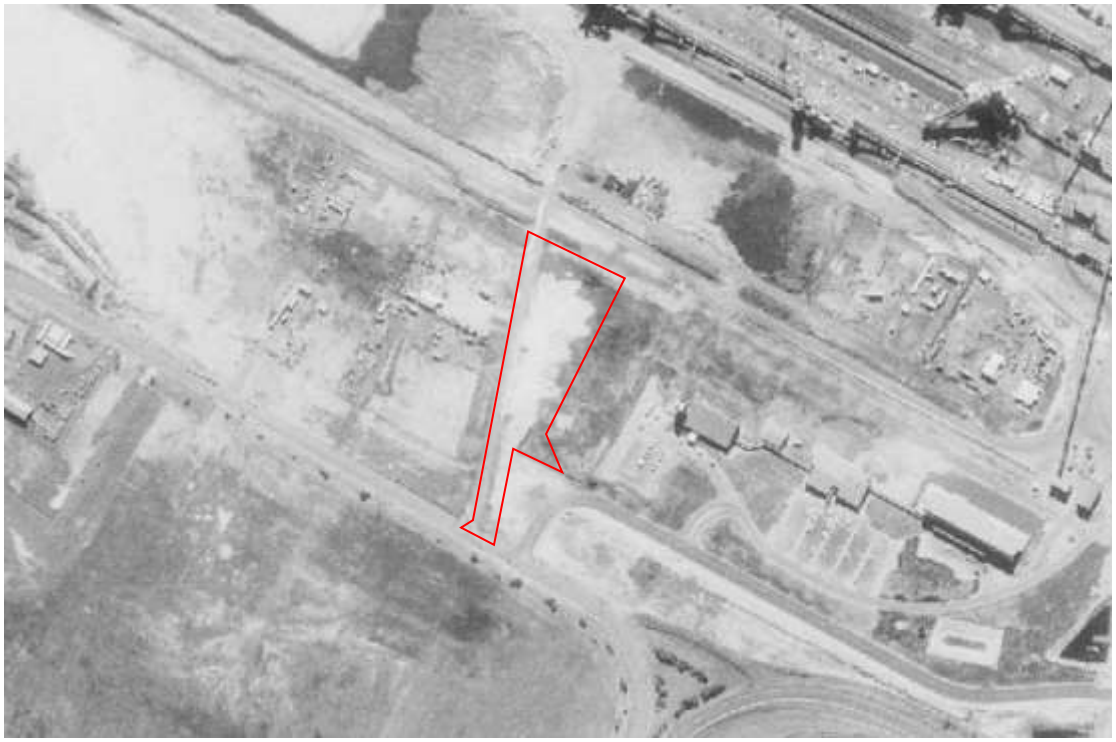
APPENDIX E:

Aerial Photographs

2020

2010

1993



1984

1976

1964

1954

APPENDIX F:

Site Photographs

Photograph 1 - Showing asphalt paved road on western boundary, leading to Port Waratah Coal Services

Photograph 2 - Showing asphalt paved road on western boundary, leading to Raven Street

Qualtest LABORATORY (NSW) PTY LTD	Client:	EJE ARCHITECTURE	Project No:	NEW20P-0171-AA
	Project:	PRELIMINARY CONTAMINATION ASSESSMENT	Date:	12/01/2021
	Location:	RAVEN STREET, KOORAGANG	No:	**1 and 2**
	Title:	SITE PHOTOGRAPHS		

Photograph 3 - Showing asphalt paved crossing in northern portion of the site

Photograph 4 - Showing grassed and gravel hardstand areas in southern portion of the site.

Qualtest LABORATORY (NSW) PTY LTD	Client:	EJE ARCHITECTURE	Project No:	NEW20P-0171-AA
	Project:	PRELIMINARY CONTAMINATION ASSESSMENT	Date:	12/01/2021
	Location:	RAVEN STREET, KOORAGANG	No:	**3 and 4**
	Title:	SITE PHOTOGRAPHS		

Photograph 5 - Showing grassed and gravel hardstand areas in northern portion of the site.

Photograph 6 - Showing grassed and gravel hardstand areas in central and southern portion of the site, and truck flat bed parked on site.

Qualtest LABORATORY (NSW) PTY LTD	Client:	EJE ARCHITECTURE	Project No:	NEW20P-0171-AA
	Project:	PRELIMINARY CONTAMINATION ASSESSMENT	Date:	12/01/2021
	Location:	RAVEN STREET, KOORAGANG	No:	**5 and 6**
	Title:	SITE PHOTOGRAPHS		

APPENDIX G:

NSW EPA Records

Search results

Your search for: Suburb: KOORAGANG

Matched 18 notices relating to 2 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
KOORAGANG	Cormorant ROAD	BHP Kooragang	1 current and 1 former
KOORAGANG	15 Greenleaf ROAD	Orica Kooragang Island	5 current and 11 former

28 October 2020

Suburb	SiteName	Address	ContaminationActivityType	ManagementClass	Latitude	Longitude
KIRRAWEE	7-Eleven (former Mobil) Service Station	542-546 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-34.03238179	151.0758071
KIRRAWEE	Caltex-branded Kirrawee Service Station	(1-3 Waratah Street) 487 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-34.02915971	151.0808279
KOGARAH	Scarborough Park South	184R Production AVENUE	Landfill	Regulation being finalised	-33.97922253	151.140276
KOGARAH	Caltex Service Station	29 President AVENUE	Service Station	Regulation under CLM Act not required	-33.96516866	151.141145
KOGARAH	7-Eleven Service Station	736 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-33.96406472	151.1376011
KOGARAH	Woolworths Petrol Service Station	69 Princes HIGHWAY	Service Station	Regulation under CLM Act not required	-33.96330397	151.1371182
KOOLKHAN	Former Koolkhan Power Station	Summerland WAY	Other Industry	Regulation under CLM Act not required	-29.61688704	152.9300645
KOORAGANG	NPC, berths 2 and 3	Heron ROAD	Metal Industry	Regulation under CLM Act not required	-32.89260063	151.7742527
KOORAGANG	Kooragang Island Waste Facility	Off Cormorant ROAD	Metal Industry	Contamination currently regulated under POEO Act	-32.86901125	151.7377773
KOORAGANG	Orica Kooragang Island	15 Greenleaf ROAD	Chemical Industry	Contamination currently regulated under CLM Act	-32.89654619	151.7771372
KOORAGANG	Former Boral Timber Export Facility	16 Heron ROAD	Other Industry	Regulation under CLM Act not required	-32.89710295	151.7739966
KOORAGANG	Cleanaway Technical Services	19 Egret STREET	Other Industry	Regulation under CLM Act not required	-32.8812145	151.766282
KOORAGANG	Industrial Facility	39 Heron ROAD	Chemical Industry	Under assessment	-32.89106439	151.7784064
KOORAGANG	Vacant Land	Raven Street and Cormorant ROAD	Unclassified	Regulation under CLM Act not required	-32.88410199	151.7701334
KOORAGANG	Linx Logistics	240 Cormorant ROAD	Other Industry	Regulation under CLM Act not required	-32.87480951	151.7757352

Search results

Your search for: **POEO Licences** with the following criteria

Suburb - kooragang
returned 34 results

Export to excel

1 of 2 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
20909	AIR LIQUIDE AUSTRALIA LIMITED	via 15 Greenleaf Road, KOORAGANG, NSW 2304	POEO licence	Issued	08 Jun 2017
5430	AMEROPA AUSTRALIA PTY LTD	107 GREENLEAF ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	01 Sep 2000
12876	AUSTPAC RESOURCES N.L.	PART OF 240 CORMORANT ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	10 Jun 2008
13046	BHP BILLITON LIMITED	Cormorant Road, KOORAGANG, NSW 2304	POEO licence	Surrendered	22 Oct 2009
20165	BOC LIMITED	9 Egret Street, KOORAGANG, NSW 2304	POEO licence	Issued	05 Oct 2012
1094	BORAL CEMENT LIMITED	100 Cormorant Road, KOORAGANG, NSW 2304	POEO licence	Issued	19 Jun 2000
11968	BORAL RECYCLING PTY LIMITED	1/24 EGRET STREET, KOORAGANG, NSW 2304	POEO licence	Issued	16 Sep 2003
1419	BORAL TIMBER FIBRE EXPORTS PTY LTD	16 HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Surrendered	15 Jun 2000
5810	CARGILL AUSTRALIA LIMITED	51 RAVEN STREET, KOORAGANG, NSW 2304	POEO licence	Issued	23 May 2001
4193	CEMENT AUSTRALIA HOLDINGS PTY LTD	KOORAGANG NO. 2 BERTH, HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	25 May 2000
6124	CLEANAWAY OPERATIONS PTY LTD	Raven Street, KOORAGANG, NSW 2304	POEO licence	Issued	17 Jul 2000
12367	CLEANAWAY PTY LTD	19 Egret Street, KOORAGANG, NSW 2304	POEO licence	Surrendered	28 Sep 2005
6437	HUNTER & CENTRAL COAST DEVELOPMENT CORPORATION	CORMORANT DRIVE, KOORAGANG, NSW 2304	POEO licence	Surrendered	08 Mar 2001
11781	INCITEC PIVOT LIMITED	HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	10 Jun 2003
2367	KOORAGANG BULK FACILITIES PTY LTD	48 HERON ROAD, KOORAGANG ISLAND, KOORAGANG, NSW 2304	POEO licence	Issued	07 Sep 2000
12521	LINX LOGISTICS PTY LTD	240 CORMORANT ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	22 Dec 2006
7434	MED-X PTY LTD	25 SANDPIPER CLOSE, KOORAGANG, NSW 2304	POEO licence	Issued	21 Jun 2000
12693	NEWCASTLE COAL INFRASTRUCTURE GROUP PTY LTD	CORMORANT ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	26 Oct 2007
12740	NEWCASTLE COAL INFRASTRUCTURE GROUP PTY LTD	Cormorant Road, KOORAGANG, NSW 2304	POEO licence	Surrendered	26 Oct 2007
2286	NEWCASTLE WOODCHIPPING PTY LTD	6 SANDPIPER CLOSE, KOORAGANG, NSW 2304	POEO licence	Surrendered	22 Aug 2000

Search results

Your search for: **POEO Licences** with the following criteria

Suburb - kooragang

returned 34 results

Export to excel

2 of 2 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
828	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	14 Nov 2000
20081	ORIGIN ENERGY LPG LIMITED	100 Cormorant Road, KOORAGANG, NSW 2304	POEO licence	Issued	17 May 2012
12977	PARK PTY LTD	18-28 GREENLEAF ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	12 Feb 2009
1967	PORT OF NEWCASTLE OPERATIONS PTY LIMITED	HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	23 Feb 2000
4687	PORT OF NEWCASTLE OPERATIONS PTY LIMITED	KOORAGANG NO. 3 BERTH, HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Surrendered	06 Jul 2000
1552	PORT WARATAH COAL SERVICES LTD	CURLEW STREET, KOORAGANG, NSW 2304	POEO licence	Issued	14 Jul 2000
7675	PORT WARATAH COAL SERVICES LTD	CORMORANT ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	21 Feb 2001
5022	PORT WARATAH COAL SERVICES LTD	CURLEW STREET, KOORAGANG, NSW 2304	POEO licence	Issued	20 Jun 2001
13022	PORT WARATAH COAL SERVICES LTD	Curlew Street, KOORAGANG, NSW 2304	POEO licence	Surrendered	02 Dec 2009
11749	PROTECH STEEL PTY LTD	CORMORANT ROAD, KOORAGANG, NSW 2304	POEO licence	Surrendered	18 Sep 2002
20493	QUBE PORTS PTY LTD	HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	24 Oct 2014
11264	SIMS GROUP AUSTRALIA HOLDINGS LIMITED	CORMORANT ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	14 Mar 2001
20512	VUE AUSTRALIA PTY. LTD.	21 HERON ROAD, KOORAGANG, NSW 2304	POEO licence	Issued	21 Nov 2014
20669	WBHO INFRASTRUCTURE PTY LTD	KOORAGANG, NSW 2304	POEO licence	Surrendered	23 Sep 2015

Search results

Your search for: **Notices** with the following criteria

Notice type - Penalty Notice
Suburb - kooragang
returned 36 results

Export to excel

1 of 2 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
3085782399	AIR LIQUIDE AUSTRALIA LIMITED	via 15 Greenleaf Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	25 Jul 2017
3085770546	AMEROPA AUSTRALIA PTY LTD	107 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	13 May 2013
3085778668	AMEROPA AUSTRALIA PTY LTD	107 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	18 Feb 2016
3173526319	AMEROPA AUSTRALIA PTY LTD	107 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	30 Oct 2018
3085765504	BOC LIMITED	9 Egret Street, KOORAGANG, NSW 2304	Penalty Notice	Issued	13 Sep 2012
3085774863	CARGILL AUSTRALIA LIMITED	51 RAVEN STREET, KOORAGANG, NSW 2304	Penalty Notice	Issued	29 Aug 2014
3085774872	CARGILL AUSTRALIA LIMITED	51 RAVEN STREET, KOORAGANG, NSW 2304	Penalty Notice	Issued	29 Aug 2014
3085769116	CHEMTRANS PTY LIMITED	39 Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	27 Feb 2013
3085770299	ECONOMY SWEEPERS PTY. LIMITED	Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	13 May 2013
3085775890	GEOFFREY SHAW	Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	20 Jan 2015
3085770133	INCITEC PIVOT LIMITED	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	31 May 2013
3085778190	INCITEC PIVOT LIMITED	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	12 Jan 2016
3085778200	INCITEC PIVOT LIMITED	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	12 Jan 2016
3085775880	JAMIE FELLOWS	Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	20 Jan 2015
3173528710	KOORAGANG BULK FACILITIES PTY LTD	48 HERON ROAD, KOORAGANG ISLAND, KOORAGANG, NSW 2304	Penalty Notice	Issued	05 Dec 2019
3173523192	LINX LOGISTICS PTY LTD	Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	05 Sep 2017
3085776082	MICHAEL GRANGER	Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	15 Apr 2015
3085767549	NEWCASTLE PORT CORPORATION	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	18 Dec 2012
3085763726	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	10 May 2012
3085766851	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	14 Dec 2012

Search results

Your search for: **Notices** with the following criteria

Notice type - Penalty Notice
Suburb - kooragang
returned 36 results

Export to excel

2 of 2 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
3085771334	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	13 Jun 2013
3085772461	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	25 Oct 2013
3085772480	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	25 Oct 2013
3085772654	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	25 Nov 2013
3085781903	ORICA AUSTRALIA PTY LTD	15 GREENLEAF ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	19 Apr 2017
3085763331	ORIGIN ENERGY LPG LIMITED	100 Cormorant Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	17 May 2012
3173526153	PORT OF NEWCASTLE OPERATIONS PTY LIMITED	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	06 Sep 2018
3085774277	PORT WARATAH COAL SERVICES LTD	CURLEW STREET, KOORAGANG, NSW 2304	Penalty Notice	Issued	11 Jul 2014
3173527776	PORT WARATAH COAL SERVICES LTD	CURLEW STREET, KOORAGANG, NSW 2304	Penalty Notice	Issued	01 Jul 2019
3085779391	QUBE PORTS PTY LTD	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	18 May 2016
3085779400	QUBE PORTS PTY LTD	KOORAGANG NO. 3 BERTH, HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	18 May 2016
3085780098	QUBE PORTS PTY LTD	HERON ROAD, KOORAGANG, NSW 2304	Penalty Notice	Issued	01 Sep 2016
3085779997	ROBERT BUSBY	Heron Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	15 Aug 2016
3085780354	SPECIALISED WASTE TREATMENT SERVICES PTY LTD	25 SANDPIPER CLOSE, KOORAGANG, NSW 2304	Penalty Notice	Issued	30 Sep 2016
3085777054	TRENT LEE	Greenleaf Road, KOORAGANG, NSW 2304	Penalty Notice	Issued	02 Jul 2015
3085773671	VENTIA UTILITY SERVICES PTY LIMITED	Raven Street, KOORAGANG, NSW 2304	Penalty Notice	Issued	03 Apr 2014

APPENDIX H:

Section 10.7 Certificate

Planning Certificate

Section 10.7, Environmental Planning and Assessment Act 1979

To: Qualtest Laboratory (NSW) Pty Ltd
8 Ironbark Close
Warabrook NSW 2304

Certificate No: PL2020/05195
Fees: $133.00
Receipt No(s): D001707928

Your Reference: NEW20P-0EJE

Date of Issue: 30/10/2020

The Land: Lot 152 DP 1202468
70 Raven Street Kooragang NSW 2304

Advice provided on this Certificate:

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

IMPORTANT: Please read this certificate carefully

This certificate contains important information about the land.

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

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

All information provided is correct as at 06/11/2020. However, it's possible for changes to occur within a short time. We recommend that you only rely upon a very recent certificate.

City of Newcastle

PO Box 489
NEWCASTLE 2300

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

Customer Contact Centre
Ground floor,
12 Stewart Avenue
Newcastle West NSW 2300

Office hours:
Mondays to Fridays 8.30 am to 5.00 pm

Part 1:

Advice provided under section 10.7(2)

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

1. Names of relevant planning instruments and DCPs

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

State Environmental Planning Policy No. 1 - Development Standards

State Environmental Planning Policy No. 21 - Caravan Parks

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

State Environmental Planning Policy No. 36 - Manufactured Home Estates

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

State Environmental Planning Policy No. 50 - Canal Estate Development

State Environmental Planning Policy No. 55 - Remediation of Land

State Environmental Planning Policy No. 64 - Advertising and Signage

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

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

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

State Environmental Planning Policy (State Significant Precincts) 2005

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

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (Infrastructure) 2007

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

State Environmental Planning Policy (Urban Renewal) 2010

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (Three Ports) 2013

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

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

State Environmental Planning Policy (Concurrences) 2018

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

2. Zoning and land use under relevant LEPs

NOTE: State Environmental Planning Policy (Three Ports) 2013 establishes the zoning and land use controls for this site.

Refer to SEPP (Three Ports) 2013 for details

Minimum land dimensions for erection of a dwelling-house: There are no minimum land dimensions for the erection of a dwelling-house that apply to this site.

Critical habitat: The land does not identify as including or comprising critical habitat.

Heritage conservation area: Refer to State Environmental Planning Policy (Three Ports) 2013

Heritage items: Refer to State Environmental Planning Policy (Three Ports) 2013

3. Complying development

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

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

Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Rural Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Low Rise Housing Diversity Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Greenfield Housing Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Inland Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Housing Alterations Code

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

General Development Code

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

Commercial and Industrial Alterations Code

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

Commercial and Industrial (New Buildings and Additions) Code

Complying development under this Code may NOT be carried out on this land, as the land is affected by Specific land exemptions, being land identified on an Acid Sulfate Soils Map as being Class 1 or Class 2.

Container Recycling Facilities Code

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

Subdivision Code

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

Demolition Code

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

Fire Safety Code

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

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

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

5. Coal Mine Subsidence Compensation Act 2017

The land IS NOT WITHIN a Mine Subsidence District declared under section 20 of the Coal Mine Subsidence Compensation Act 2017.

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

6. Road widening or realignment

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

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

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

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

7. Policies on hazard risk restrictions

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

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

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

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

7A. Flood related development controls information

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

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

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

8. Land reserved for acquisition

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

9. Contributions plans

The following contribution plan/s apply to the land.

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

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

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

9A. Biodiversity certified land

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

10. Biodiversity stewardship sites

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

10A. Native vegetation clearing set asides

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

11. Bush fire prone land

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

12. Property vegetation plans

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

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

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

14. Directions under Part 3A

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

15. Site compatibility certificates and conditions for seniors housing

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

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

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

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

17. Site compatibility certificates and conditions for affordable rental housing

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

18. Paper subdivision information

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

19. Site verification certificates

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

20. Loose-fill asbestos insulation

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

21. Affected building notices and building product rectification orders

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

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

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

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

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

Part 2:

Advice provided under section 10.7(5)

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

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

Our records indicate that this premise IS NOT AFFECTED by a current notice or order (excluding the notices or orders mentioned in the note below).
NOTE: CN has not inspected the premises immediately prior to the issue of this certificate. It is possible that the premises are affected by matters of which we are unaware.

NOTE: This Certificate does not include any advice regarding outstanding notices or orders issued under the Environmental Planning and Assessment Act 1979 or the Local Government Act 1993. To obtain advice regarding these matters, you should lodge an application for a Certificate as to Outstanding Notices and

Orders (accompanied by the appropriate fee). For further information, please contact the Customer Contact Centre on (02) 4974 2000.

23. Draft development control plans.

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

24. Heritage Act 1977.

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

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

25. Listing by National Trust of Australia.

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

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

26. Australian Heritage Database.

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

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

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

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

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

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

Matters of national environmental significance are:

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

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

28. Other matters

The land is affected by the following:

Newcastle earthquake

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

Issued without alterations or additions, 30/10/20
Authorised by

JEREMY BATH
CHIEF EXECUTIVE OFFICER

APPENDIX I:

Borehole Logs

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH01
CLIENT: NORTHROP CONSULTING ENGINEERS
PAGE: 1 OF 1
PROJECT: PROPOSED INDUSTRIAL WAREHOUSE FACILITY
JOB NO: NEW20P-0171
LOCATION: LOT 152, RAVEN STREET, KOORAGANG
LOGGED BY: BS
DATE: 12/1/21

DRILL TYPE: TRACK MOUNTED DRILL RIG
SURFACE RL:
BOREHOLE DIAMETER: 100 mm
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T		0.10m E				GP	FILL: Sandy GRAVEL - fine to medium grained, sub-angular to angular, pale grey to brown, fine to medium grained sand, trace fines of low plasticity.	D				FILL
							0.20m FILL: SAND - fine to medium grained, brown, with shells.					
		0.50m		0.5								
		0.60m E				SP		D - M				
		1.00m		1.0								
		1.10m E										
							1.40m					
		1.50m		1.5			Silty CLAY - medium to high plasticity, grey to dark grey.					ESTUARINE DEPOSITS
		1.60m E										
		2.00m		2.0		CH		M > w_P	F / St	HP	100	
		2.10m E								HP	110	
	▶									HP	55	
		2.50m		2.5			2.50m					
		2.60m E				CH	Silty Sandy CLAY - medium to high plasticity, grey to dark grey, fine to medium grained sand.			HP	65	
							2.70m Clayey SAND - fine to medium grained, grey to dark grey, fines of low to medium plasticity.					
		3.00m		3.0		SC						
		3.10m E					3.30m					
		3.50m		3.5			SAND - fine to medium grained, grey with shells.	W				ALLUVIAL
		3.60m E				SP						
		4.00m		4.0								
		4.10m E					4.10m					
				4.5			Hole Terminated at 4.10 m Borehole Collapse					

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH02

CLIENT: NORTHROP CONSULTING ENGINEERS
PAGE: 1 OF 1

PROJECT: PROPOSED INDUSTRIAL WAREHOUSE FACILITY
JOB NO: NEW20P-0171

LOCATION: LOT 152, RAVEN STREET, KOORAGANG
LOGGED BY: BS

DATE: 12/1/21

DRILL TYPE: TRACK MOUNTED DRILL RIG
SURFACE RL:

BOREHOLE DIAMETER: 100 mm
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		Structure and additional observations
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	
AD/T		0.10m E				GC	FILL: Clayey Sandy GRAVEL - fine to medium grained, sub angular to angular, brown to grey-brown, fine to coarse grained sand, fines of low to medium plasticity.	M				FILL
		0.50m		0.5								
		0.60m E					0.65m					
						ML	FILL: SILT - low plasticity, white to pale grey, with some crystalline material, possibly gypsum.	M < w_p				
							0.85m					
		1.00m		1.0		SP	FILL: SAND - fine to medium grained, brown.					
		1.10m E					1.10m	D - M				
						CH	FILL: CLAY - medium to high plasticity, brown to dark brown.		VSt	HP	270	
							1.30m			HP	330	
						SP	FILL: SAND - fine to medium grained, grey to dark grey, with some black, with trace glass.	M - W		HP	250	
		1.50m		1.5			1.50m					
		1.60m E					SAND - fine to medium grained, brown.					ALLUVIAL / POSSIBLE FILL
							Becoming brown to pale brown.					
		2.00m		2.0		SP		W				
	▶	2.10m E					2.20m					
							Hole Terminated at 2.20 m Borehole Collapse					
				2.5								
				3.0								
				3.5								
				4.0								
				4.5								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH03

CLIENT: NORTHROP CONSULTING ENGINEERS | **PAGE:** 1 OF 1

PROJECT: PROPOSED INDUSTRIAL WAREHOUSE FACILITY | **JOB NO:** NEW20P-0171

LOCATION: LOT 152, RAVEN STREET, KOORAGANG | **LOGGED BY:** BS

DATE: 12/1/21

DRILL TYPE: TRACK MOUNTED DRILL RIG | **SURFACE RL:**

BOREHOLE DIAMETER: 100 mm | **DATUM:** AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
							Asphalt.	D				ASPHALT
		0.25m					0.25m					
		0.35m E				ML	FILL: SILT - low plasticity, white to pale grey, with some crystalline material, possibly gypsum.	M < W_P				FILL
		0.50m		0.5			0.60m					
						SP	FILL: SAND - fine to medium grained, pale brown to yellow-brown.	D				
							0.80m					
						SP	FILL: SAND - fine to medium grained, grey to grey-brown, trace fine grained, angular gravel, with shells.	D - M				
		1.00m		1.0			1.00m					
						SP	FILL: SAND - fine to medium grained, brown to dark brown with some grey-brown, trace fine grained, sub-rounded to sub-angular gravel, with shells.	D				
		1.50m		1.5								
		1.60m E					1.60m					
							SAND - fine to medium grained, grey to dark grey-brown.					ALLUVIAL
AD/T		2.00m		2.0				M				
		2.10m E										
		2.50m		2.5			Becoming brown to pale brown.					
		2.60m E				SP		M - W				
	▶	3.00m		3.0								
		3.10m E										
							Becoming brown to grey-brown.					
		3.50m		3.5				W				
		3.60m E										
							3.80m					
		4.00m		4.0		SP	SAND - fine to coarse grained, grey with some grey-brown.					
		4.10m E					4.10m					
							Hole Terminated at 4.10 m Borehole Collapse					
				4.5								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

ENGINEERING LOG - BOREHOLE

BOREHOLE NO: BH04
CLIENT: NORTHROP CONSULTING ENGINEERS
PAGE: 1 OF 1
PROJECT: PROPOSED INDUSTRIAL WAREHOUSE FACILITY
JOB NO: NEW20P-0171
LOCATION: LOT 152, RAVEN STREET, KOORAGANG
LOGGED BY: BS
DATE: 12/1/21

DRILL TYPE: TRACK MOUNTED DRILL RIG
SURFACE RL:
BOREHOLE DIAMETER: 100 mm
DATUM: AHD

Drilling and Sampling					Material description and profile information					Field Test		
METHOD	WATER	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION: Soil type, plasticity/particle characteristics,colour,minor components	MOISTURE CONDITION	CONSISTENCY DENSITY	Test Type	Result	Structure and additional observations
AD/T		0.10m E				GP	FILL: Sandy GRAVEL - fine to medium grained, sub-angular to angular, grey-brown to brown, fine to medium grained sand, trace fines of low plasticity.	D - M				FILL
							0.20m					
						SP	FILL: Gravelly SAND - fine to medium grained, brown, fine grained, angular to sub-angular gravel.	M				
							0.40m					
		0.50m		0.5			FILL: SAND - fine to medium grained, brown and pale brown, with shells.					
		0.60m E										
		1.00m		1.0								
		1.10m E				SP		M				
		1.50m		1.5								
		1.60m E										
		2.00m		2.0			2.00m					
		2.10m E					CLAY - medium to high plasticity, grey and dark grey.			HP	120	ESTUARINE DEPOSITS
		2.50m		2.5		CH		M > w_P	F / St	HP	110	
		2.60m E								HP	170	
										HP	150	
										HP	100	
							2.90m					
		3.00m		3.0			SAND - fine to medium grained, grey, trace fines of low plasticity, trace fine grained, sub-rounded gravel.	M - W				ALLUVIAL
	▶	3.50m		3.5		SP	Becoming brown and pale brown.					
		3.60m E						W				
		4.00m		4.0								
		4.10m E					4.10m					
							Hole Terminated at 4.10 m Borehole Collapse					
				4.5								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

APPENDIX J:

Data Validation Report

QA/QC DATA VALIDATION REPORT
Job No: NEW20P-0171-AA

Eurofins report: 767263-S, 769500-S, 769500-AID

1. SAMPLE HANDLING

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

Sampling Handling was:

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

2. PRECISION AND ACCURACY ASSESSMENT

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

Laboratory Precision and Accuracy was:

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

3. FIELD QA/QC

Soil, Sediment and Water Samples

	Soil/Sediment
No. Samples Analysed	13
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	Soil
Number of Days Sampling	1
Number of Sampling Events	1

Field Duplicates

Item	Yes/No	Comments
Were an adequate number of field duplicates collected?	Yes	Duplicates collected at a rate of 1 per 13 samples.
Were RPDs within control limits? No Limit for 5-10 x EQL and 30% for >10 x EQL	Yes	

Trip Blanks/Trip Spikes

Item	Yes/No	Comments
Were an adequate number of trip blanks and trip spikes collected?	No	Trip blanks and trip spikes were not collected. Taking into account field observations (odours, PID readings), the lack of trip blank/spike samples is not considered to affect the outcome of the assessment.
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 samples used? (1 per day of using reusable sampling equipment – trowel, hand auger etc)	No	A rinsate sample was not collected. The sampling equipment was decontaminated between locations, in accordance with Qualtest SOPs. Based on the laboratory results no evidence of cross contamination has been observed.
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).	NA	

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) 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 : ✓	Partially Satisfactory:	Unsatisfactory:

5. DATA USABILITY

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

APPENDIX K:

Laboratory Documentation

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Qualtest	Project №	NEW20P-0171	Project Manager	Emma Coleman
Address	8 Ironbark Close Warabrook NSW 2304	Project Name	EJE, KOORAGANG	EDD Format (ESdat, EQuIS etc)	Excel
Contact Name	Emma Coleman				
Phone №					
Special Directions	Please not short holding times left				
Purchase Order					
Quote ID №	180622QUAN-1				

Sampler(s)	Billy Snow	
Handed over by		
Email for Invoice	accounts@qualtest.com.au	
Email for Results	libbybetz@qualtest.com.au emmacoleman@qualtest.com.au stephcullen@qualtest.com.au billysnow@qualtest.com.au	

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

+Surcharge will apply
☐ Overnight (reporting by 9am)+
☐ Same day◆ ☐ 1 day◆
☐ 2 days◆ ☐ 3 days◆
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7 (TRH, BTEX, PAHs, Metals	Asbestos (presence/absence)	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH03 3.0-3.1	12/01/21	SOIL										1	
2	BH03 3.5-3.6	12/1/21	SOIL										1	
3	BH03 4.0-4.1	12/1/21	SOIL										1	
4	BH04 0.5-0.6	12/1/21	SOIL	X									1	88 ✓
5	BH04 1.5-1.6	12/1/21	SOIL										1	
6	BH04 2.5-2.6	12/1/21	SOIL										1	
7	BH04 3.5-3.6	12/1/21	SOIL										1	
8	BH04 4.0-4.1	12/1/21	SOIL										1	
9	BH01 0.0-0.1	12/1/21	SOIL	X	X							1	1	93 ✓
10	BH01 1.5-1.6	12/1/21	SOIL									1	1	
	Total Counts			2	1							2	10	

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name | Signature | Date | Time

Laboratory Use Only						
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature	
Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №	

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

767263-769500
RFR14

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Qualtest	Project №	NEW20P-0171	Project Manager	Emma Coleman
Address	8 Ironbark Close Warabrook NSW 2304	Project Name	EJE, KOORAGANG	EDD Format (ESdat, EQuIS etc)	Excel
Contact Name	Emma Coleman				
Phone №					
Special Directions					
Purchase Order					
Quote ID №	180622QUAN-1				

Sampler(s)	Billy Snow				
Handed over by					
Email for Invoice	accounts@qualtest.com.au				
Email for Results	libbybetz@qualtest.com.au emmacoleman@qualtest.com.au stephcullen@qualtest.com.au billysnow@qualtest.com.au				

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☐ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☑ 5 days (Standard)
☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7 (TRH, BTEX, PAHs, Metals	Asbestos (presence/absence)	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01 1.0-1.1	12/01/21	SOIL	X									1	J908375 ✓
2	BH01 2.0-2.1	12/1/21	SOIL	X									1	76 ✓
3	BH01 2.5-2.6	12/1/21	SOIL										1	
4	BH01 3.5-3.6	12/1/21	SOIL										1	
5	BH01 4.0-4.1	12/1/21	SOIL										1	
6	BH02 1.0-1.1	12/1/21	SOIL	X									1	80 ✓
7	BH02 1.5-1.6	12/1/21	SOIL										1	
8	BH02 2.0-2.1	12/1/21	SOIL										1	
9	BH03 1.5-1.6	12/1/21	SOIL	X									1	83 ✓
10	BH03 2.5-2.6	12/1/21	SOIL										1	
	Total Counts			4									10	

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name | Signature | Date | Time

Laboratory Use Only							
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	Time	Report №

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ **Sydney Laboratory** Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	Qualtest	Project №	NEW20P-0171	Project Manager	Emma Coleman
Address	8 Ironbark Close Warabrook NSW 2304	Project Name	EJE, KOORAGANG	EDD Format (ESdat, EQuIS etc)	Excel
Contact Name	Emma Coleman				
Phone №					
Special Directions					
Purchase Order					
Quote ID №	180622QUAN-1				

Sampler(s)	Billy Snow				
Handed over by					
Email for Invoice	accounts@qualtest.com.au				
Email for Results	libbybetz@qualtest.com.au emmacoleman@qualtest.com.au stephcullen@qualtest.com.au billysnow@qualtest.com.au				

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	Suite B7 (TRH, BTEX, PAHs, Metals	Asbestos (presence/absence)	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH02 0.0-0.1	12/01/21	SOIL	X	X							1	1	95 ✓
2	BH02 1.0-1.1	12/1/21	SOIL									1	1	
3	BH03 0.25-0.35	12/1/21	SOIL	X	X							1	1	97 ✓
4	BH03 1.5-1.6	12/1/21	SOIL									1	1	
5	BH04 0.0-0.1	12/1/21	SOIL	X	X							1	1	99 ✓
6	BH04 1.5-1.6	12/1/21	SOIL									1	1	
7	D.12.1.21	12/1/21	SOIL	X	X							1		401 ✓
8														
9														
10														
			Total Counts	4	4							7	6	

Containers — Change container type & size if necessary

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☐ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

Name | Signature | Date | Time

Laboratory Use Only

Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date	Time	Report №

Eurofins Environment Testing Australia Pty Ltd

*Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521
Phone: +61 3 8564 5000
e.mail: EnviroRemittances@eurofins.com

Tax Invoice

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Purchase Order #: Not provided
Invoice #: 602308
Date: Feb 02, 2021
Report #: 769500
Project Name: EJE KOORAGANG
Project ID: NEW20P-0171
Contact: Emma Coleman

Description	Quantity	Price	Total	Notes
Solid Samples				
Asbestos - AS4964	5	$30.00	$150.00	
Eurofins Suite B7	10	$76.80	$768.00	
Handling Charge	1	$30.00	$30.00	

Notes: Quote: 180622QUAN-1	Nett Total	$948.00
	GST	$94.80
	Total Inc GST	$1,042.80

This invoice is subject to Eurofins General Terms of Sales. Copies available on request or at http://environment.eurofins.com.au

Please detach and return with payment to:
Postal:
Eurofins Environment Testing
6 Monterey Road
Dandenong South
Victoria, 3175

Please EFT Payments to:
Eurofins Environment Testing
BSB 063-498
Acct No: 10057019
e.mail Remittances:
EnviroRemittances@eurofins.com

Invoice Number : 602308
Amount Inc GST : $1,042.80

TERMS STRICTLY 30 DAYS

Certificate of Analysis

eurofins | Environment Testing

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	769500-AID
Project Name	EJE KOORAGANG
Project ID	NEW20P-0171
Received Date	Jan 22, 2021
Date Reported	Feb 02, 2021

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name EJE KOORAGANG
Project ID NEW20P-0171
Date Sampled Jan 12, 2021
Report 769500-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH01 0.0-0.1	21-Ja29015	Jan 12, 2021	Approximate Sample 47g Sample consisted of: Brown coarse-grained clayey-sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH02 0.0-0.1	21-Ja29020	Jan 12, 2021	Approximate Sample 66g Sample consisted of: Brown coarse-grained clayey-sandy soil	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH03 0.25-0.35	21-Ja29021	Jan 12, 2021	Approximate Sample 30g Sample consisted of: Sand residue and white powdery foam stone like material	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH04 0.0-0.1	21-Ja29022	Jan 12, 2021	Approximate Sample 70g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
D.12.1.21	21-Ja29023	Jan 12, 2021	Approximate Sample 68g Sample consisted of: Brown coarse-grained sandy soil, organic debris and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jan 25, 2021	Indefinite

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

Australia

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

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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Perth
2/91 Leach Highway
Kewdale WA 6105
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Newcastle
4/52 Industrial Drive
Mayfield East NSW 2304
PO Box 60 Wickham 2293
Phone : +61 2 4968 8448

New Zealand

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

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

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

Project Name: EJE KOORAGANG
Project ID: NEW20P-0171

Order No.:
Report #: 769500
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jan 22, 2021 8:15 PM
Due: Feb 2, 2021
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X		
Brisbane Laboratory - NATA Site # 20794							X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH04 0.5-0.6	Jan 12, 2021		Soil	B21-Ja29014		X	X
2	BH01 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29015	X	X	X
3	BH01 1.0-1.1	Jan 12, 2021		Soil	B21-Ja29016		X	X
4	BH01 2.0-2.1	Jan 12, 2021		Soil	B21-Ja29017		X	X
5	BH02 1.0-1.1	Jan 12, 2021		Soil	B21-Ja29018		X	X
6	BH03 1.5-1.6	Jan 12, 2021		Soil	B21-Ja29019		X	X
7	BH02 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29020	X	X	X
8	BH03 0.25-0.35	Jan 12, 2021		Soil	B21-Ja29021	X	X	X

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Christchurch
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Phone : 0800 856 450
IANZ # 1290

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

Project Name: EJE KOORAGANG
Project ID: NEW20P-0171

Order No.:
Report #: 769500
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jan 22, 2021 8:15 PM
Due: Feb 2, 2021
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X		
Brisbane Laboratory - NATA Site # 20794							X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
9	BH04 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29022	X	X	X
10	D.12.1.21	Jan 12, 2021		Soil	B21-Ja29023	X	X	X
Test Counts						5	10	10

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

Units

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

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

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

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

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

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Phone : +61 2 4968 8448

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

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

Sample Receipt Advice

Company name:	Qualtest
Contact name:	Emma Coleman
Project name:	EJE KOORAGANG
Project ID:	NEW20P-0171
Turnaround time:	5 Day
Date/Time received	Jan 22, 2021 8:15 PM
Eurofins reference	769500

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
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.

Global Leader - Results you can trust

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

Project Name: EJE KOORAGANG
Project ID: NEW20P-0171

Order No.:
Report #: 769500
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jan 22, 2021 8:15 PM
Due: Feb 2, 2021
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X		
Brisbane Laboratory - NATA Site # 20794							X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH04 0.5-0.6	Jan 12, 2021		Soil	B21-Ja29014		X	X
2	BH01 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29015	X	X	X
3	BH01 1.0-1.1	Jan 12, 2021		Soil	B21-Ja29016		X	X
4	BH01 2.0-2.1	Jan 12, 2021		Soil	B21-Ja29017		X	X
5	BH02 1.0-1.1	Jan 12, 2021		Soil	B21-Ja29018		X	X
6	BH03 1.5-1.6	Jan 12, 2021		Soil	B21-Ja29019		X	X
7	BH02 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29020	X	X	X
8	BH03 0.25-0.35	Jan 12, 2021		Soil	B21-Ja29021	X	X	X

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Project Name: EJE KOORAGANG
Project ID: NEW20P-0171

Order No.:
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Received: Jan 22, 2021 8:15 PM
Due: Feb 2, 2021
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X		
Brisbane Laboratory - NATA Site # 20794							X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
9	BH04 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29022	X	X	X
10	D.12.1.21	Jan 12, 2021		Soil	B21-Ja29023	X	X	X
Test Counts						5	10	10

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 20794

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

Attention: **Emma Coleman**

Report **769500-S**
Project name EJE KOORAGANG
Project ID NEW20P-0171
Received Date Jan 22, 2021

Client Sample ID			**BH04 0.5-0.6**	**BH01 0.0-0.1**	**BH01 1.0-1.1**	**BH01 2.0-2.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B21-Ja29014**	**B21-Ja29015**	**B21-Ja29016**	**B21-Ja29017**
Date Sampled			**Jan 12, 2021**	**Jan 12, 2021**	**Jan 12, 2021**	**Jan 12, 2021**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	65	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	60	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	125	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	63	70	70	71
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	110	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	110	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH04 0.5-0.6	BH01 0.0-0.1	BH01 1.0-1.1	BH01 2.0-2.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B21-Ja29014	B21-Ja29015	B21-Ja29016	B21-Ja29017
Date Sampled			Jan 12, 2021	Jan 12, 2021	Jan 12, 2021	Jan 12, 2021
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	101	96	100
p-Terphenyl-d14 (surr.)	1	%	110	110	106	111
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.4	2.2	7.2
Cadmium	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Chromium	5	mg/kg	< 5	53	< 5	49
Copper	5	mg/kg	< 5	5.9	< 5	35
Lead	5	mg/kg	5.3	7.9	< 5	30
Mercury	0.1	mg/kg	< 0.1	0.2	< 0.1	0.1
Nickel	5	mg/kg	< 5	< 5	< 5	48
Zinc	5	mg/kg	20	58	16	320
% Moisture	1	%	5.3	10	14	38

Client Sample ID			BH02 1.0-1.1	BH03 1.5-1.6	BH02 0.0-0.1	BH03 0.25-0.35
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B21-Ja29018	B21-Ja29019	B21-Ja29020	B21-Ja29021
Date Sampled			Jan 12, 2021	Jan 12, 2021	Jan 12, 2021	Jan 12, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	21	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	76	76	65
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			BH02 1.0-1.1	BH03 1.5-1.6	BH02 0.0-0.1	BH03 0.25-0.35
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B21-Ja29018	B21-Ja29019	B21-Ja29020	B21-Ja29021
Date Sampled			Jan 12, 2021	Jan 12, 2021	Jan 12, 2021	Jan 12, 2021
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	110	99	91	100
p-Terphenyl-d14 (surr.)	1	%	123	109	100	111
Heavy Metals						
Arsenic	2	mg/kg	4.7	< 2	3.4	< 2
Cadmium	0.5	mg/kg	4.1	< 0.5	5.3	7.4
Chromium	5	mg/kg	16	14	10	51
Copper	5	mg/kg	10	21	6.7	< 5
Lead	5	mg/kg	51	44	14	10
Mercury	0.1	mg/kg	0.2	< 0.1	1.7	0.3
Nickel	5	mg/kg	10	< 5	< 5	5.7
Zinc	5	mg/kg	180	67	56	21
% Moisture	1	%	16	6.0	20	26

Client Sample ID			BH04 0.0-0.1	D.12.1.21
Sample Matrix			Soil	Soil
Eurofins Sample No.			B21-Ja29022	B21-Ja29023
Date Sampled			Jan 12, 2021	Jan 12, 2021
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	110
TRH C29-C36	50	mg/kg	< 50	120
TRH C10-C36 (Total)	50	mg/kg	< 50	230

Client Sample ID			BH04 0.0-0.1	D.12.1.21
Sample Matrix			Soil	Soil
Eurofins Sample No.			B21-Ja29022	B21-Ja29023
Date Sampled			Jan 12, 2021	Jan 12, 2021
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	67	66
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	200
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	200
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	102	100
p-Terphenyl-d14 (surr.)	1	%	114	112
Heavy Metals				
Arsenic	2	mg/kg	2.4	2.8
Cadmium	0.5	mg/kg	0.6	0.6
Chromium	5	mg/kg	6.5	50
Copper	5	mg/kg	< 5	6.2
Lead	5	mg/kg	7.6	8.4
Mercury	0.1	mg/kg	0.1	0.2
Nickel	5	mg/kg	< 5	< 5
Zinc	5	mg/kg	28	45
% Moisture	1	%	6.3	5.9

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Brisbane	Jan 25, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Brisbane	Jan 25, 2021	14 Days
- Method: USEPA SW846 8260			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Jan 25, 2021	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Brisbane	Jan 25, 2021	0 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Brisbane	Jan 25, 2021	14 Days
- Method: USEPA M 8270 (LTM-ORG-2130 PAH & Phenols in Soil & Water by GC-MS)			
Metals M8	Brisbane	Jan 25, 2021	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Brisbane	Jan 25, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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

Australia

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

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

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

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

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

New Zealand

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

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

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

Project Name: EJE KOORAGANG
Project ID: NEW20P-0171

Order No.:
Report #: 769500
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jan 22, 2021 8:15 PM
Due: Feb 2, 2021
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X		
Brisbane Laboratory - NATA Site # 20794							X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH04 0.5-0.6	Jan 12, 2021		Soil	B21-Ja29014		X	X
2	BH01 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29015	X	X	X
3	BH01 1.0-1.1	Jan 12, 2021		Soil	B21-Ja29016		X	X
4	BH01 2.0-2.1	Jan 12, 2021		Soil	B21-Ja29017		X	X
5	BH02 1.0-1.1	Jan 12, 2021		Soil	B21-Ja29018		X	X
6	BH03 1.5-1.6	Jan 12, 2021		Soil	B21-Ja29019		X	X
7	BH02 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29020	X	X	X
8	BH03 0.25-0.35	Jan 12, 2021		Soil	B21-Ja29021	X	X	X

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

Australia

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

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Unit F3, Building F
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NATA # 1261
Site # 23736

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

New Zealand

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

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

Company Name: Qualtest
Address: 8 Ironbark Close
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Contact Name: Emma Coleman

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - AS4964	Moisture Set	Eurofins Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X		
Brisbane Laboratory - NATA Site # 20794							X	X
Perth Laboratory - NATA Site # 23736								
Mayfield Laboratory								
External Laboratory								
9	BH04 0.0-0.1	Jan 12, 2021		Soil	B21-Ja29022	X	X	X
10	D.12.1.21	Jan 12, 2021		Soil	B21-Ja29023	X	X	X
Test Counts						5	10	10

eurofins | Environment Testing

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	74			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	81			70-130	Pass	
Toluene	%	84			70-130	Pass	
Ethylbenzene	%	81			70-130	Pass	
m&p-Xylenes	%	78			70-130	Pass	
Xylenes - Total*	%	79			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	71			70-130	Pass	
TRH >C10-C16	%	102			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	116			70-130	Pass	
Acenaphthylene	%	115			70-130	Pass	
Anthracene	%	117			70-130	Pass	
Benz(a)anthracene	%	113			70-130	Pass	
Benzo(a)pyrene	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	%	100			70-130	Pass	
Benzo(g.h.i)perylene	%	104			70-130	Pass	
Benzo(k)fluoranthene	%	118			70-130	Pass	
Chrysene	%	117			70-130	Pass	
Dibenz(a.h)anthracene	%	103			70-130	Pass	
Fluoranthene	%	112			70-130	Pass	
Fluorene	%	117			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	103			70-130	Pass	
Naphthalene	%	116			70-130	Pass	
Phenanthrene	%	116			70-130	Pass	
Pyrene	%	113			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	98			80-120	Pass	
Cadmium	%	102			80-120	Pass	
Chromium	%	106			80-120	Pass	
Copper	%	110			80-120	Pass	
Lead	%	102			80-120	Pass	
Mercury	%	105			80-120	Pass	
Nickel	%	109			80-120	Pass	
Zinc	%	106			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Chromium	B21-Ja22327	NCP	%	88			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	B21-Ja29015	CP	%	89			70-130	Pass	
TRH C10-C14	B21-Ja29015	CP	%	98			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	B21-Ja29015	CP	%	99			70-130	Pass	
Toluene	B21-Ja29015	CP	%	102			70-130	Pass	
Ethylbenzene	B21-Ja29015	CP	%	99			70-130	Pass	
m&p-Xylenes	B21-Ja29015	CP	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
o-Xylene	B21-Ja29015	CP	%	97			70-130	Pass	
Xylenes - Total*	B21-Ja29015	CP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	B21-Ja29015	CP	%	89			70-130	Pass	
TRH >C10-C16	B21-Ja29015	CP	%	95			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	B21-Ja29015	CP	%	104			70-130	Pass	
Acenaphthylene	B21-Ja29015	CP	%	101			70-130	Pass	
Anthracene	B21-Ja29015	CP	%	105			70-130	Pass	
Benz(a)anthracene	B21-Ja29015	CP	%	107			70-130	Pass	
Benzo(a)pyrene	B21-Ja29015	CP	%	99			70-130	Pass	
Benzo(b&j)fluoranthene	B21-Ja29015	CP	%	115			70-130	Pass	
Benzo(g.h.i)perylene	B21-Ja29015	CP	%	96			70-130	Pass	
Benzo(k)fluoranthene	B21-Ja29015	CP	%	99			70-130	Pass	
Chrysene	B21-Ja29015	CP	%	105			70-130	Pass	
Dibenz(a.h)anthracene	B21-Ja29015	CP	%	94			70-130	Pass	
Fluoranthene	B21-Ja29015	CP	%	106			70-130	Pass	
Fluorene	B21-Ja29015	CP	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	B21-Ja29015	CP	%	95			70-130	Pass	
Naphthalene	B21-Ja29015	CP	%	106			70-130	Pass	
Phenanthrene	B21-Ja29015	CP	%	104			70-130	Pass	
Pyrene	B21-Ja29015	CP	%	106			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B21-Ja29015	CP	%	97			75-125	Pass	
Cadmium	B21-Ja29015	CP	%	111			75-125	Pass	
Copper	B21-Ja29015	CP	%	99			75-125	Pass	
Lead	B21-Ja29015	CP	%	98			75-125	Pass	
Mercury	B21-Ja29015	CP	%	118			75-125	Pass	
Nickel	B21-Ja29015	CP	%	102			75-125	Pass	
Zinc	B21-Ja29015	CP	%	75			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B21-Ja29014	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	B21-Ja29014	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	B21-Ja29014	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	B21-Ja29014	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B21-Ja29014	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	B21-Ja29014	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	B21-Ja29014	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	B21-Ja29014	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	B21-Ja29014	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	B21-Ja29014	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	B21-Ja29014	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	B21-Ja29014	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	B21-Ja29014	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	B21-Ja29014	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	B21-Ja29014	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B21-Ja22326	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	B21-Ja22326	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	B21-Ja22326	NCP	mg/kg	15	16	5.0	30%	Pass	
Copper	B21-Ja22326	NCP	mg/kg	18	17	8.0	30%	Pass	
Lead	B21-Ja22326	NCP	mg/kg	7.9	8.1	2.0	30%	Pass	
Mercury	B21-Ja22326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B21-Ja22326	NCP	mg/kg	10	11	2.0	30%	Pass	
Zinc	B21-Ja22326	NCP	mg/kg	38	34	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B21-Ja29014	CP	%	5.3	5.2	3.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Andrew Black	Analytical Services Manager
Jonathon Angell	Senior Analyst-Organic (QLD)
Jonathon Angell	Senior Analyst-Volatile (QLD)
Steven Trout	Senior Analyst-Metal (QLD)

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.