Proposed Residential Subdivision Preliminary Contamination Assessment

27-61 Nikko Road, Warnervale NSW

NEW17P-0106-AA
19 July 2017

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19 July 2017

KINGSTON PROPERTY FUND No. 2 Pty Ltd
C/- Shaddock Architects Pty Ltd
33 Scott Street
NEWCASTLE EAST NSW 2300

Attention: Mr Peter Shaddock

Dear Peter

RE: PROPOSED HOUSING DEVELOPMENT
27-61 NIKKO ROAD, WARNERVALE NSW
PRELIMINARY CONTAMINATION ASSESSMENT

Please find enclosed our Preliminary Contamination Assessment report for the proposed residential subdivision located at 27-61 Nikko Road, Warnervale NSW.

Based on information provided by Shaddock Architects the site will comprise a 75- dwelling housing development in the future. Central Coast Council (formerly Wyong Shire Council) indicated that the site may have been used for poultry farming in the past. Therefore, Council required a Preliminary Contamination Assessment as part of the Development Application (DA) submission.

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

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

For and on behalf of Qualtest Laboratory (NSW) Pty Ltd

Emma Coleman
Senior Environmental Scientist

Executive Summary

Qualtest Laboratory NSW Pty Ltd (Qualtest) prepared a Preliminary Contamination Assessment (PCA) for Kingston Property Fund No. 2 Pty Ltd for the proposed housing development located at 27-61 Nikko Road, Warnervale NSW (the site).

The site is approximately 3.6ha in area, and is proposed to be developed into a 75-dwelling housing development. Central Coast Council (formerly Wyong Shire Council) indicated that the site may have been used for poultry farming in the past. Therefore, Council required a PCA as part of the Development Application (DA) submission.

The objectives of the PCA were to provide a preliminary assessment of the potential for soil contamination to be present on the site.

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

- Desk study and site history review to assess Areas of Environmental Concern (AECs) and associated Chemicals of Potential Concern (COPC);
- Excavation of four test pits (TP1 to TP4) and collection of soil samples;
- Collection of four surface soil samples (SS1 to SS4);
- Laboratory analysis of selected soil samples for the COPC identified; and
- Data assessment and preparation of a PCA report.

The site history review showed that an area about 6,000m^2 in the southern portion of the site was used for chicken farming from about the 1940's until the 1990's. Prior to this the site was likely to have remained as undeveloped bushland.

Four AECs were identified for the site, relating to: use of the site for chicken farming; use of hazardous building materials; use of fill of unknown origin and quality; and surface water and sediments in onsite dams.

Sampling and analysis targeted these AECs. It is noted the sampling density in the area of concern, the 6,000m^2 area in the southern portion of the site did not meet the NSW EPA (1995) Sampling Design Guidelines due to the preliminary nature of the assessment.

No fill or buried waste materials were identified in the four test pits excavated, and there was no obvious evidence of the use of fill materials, or burial of wastes, on the site. Fragments of ACM were observed in surface soils in two locations on the site: in test pit TP2 in the footprint of what was considered likely to be the former house, and in surface sample SS4 adjacent to a concrete slab from a former shed. Several fragments were observed in the TP2 location, one fragment was observed in the SS4 location.

The laboratory results reported concentrations of copper and zinc above the adopted EILs in surface soils three locations, TP2, TP3 and SS3. Taking into account that the site is currently densely vegetated, it is considered that the exceedance of the EILs is unlikely to preclude future occupants to grow gardens.

Laboratory analysis showed the ACM fragments contained amosite and chrysotile asbestos. Samples collected in these locations showed asbestos was below the HSL for asbestos. It is noted that there is also a requirement for no visible asbestos in the top 10cm of the site surface.

Based on the site history and laboratory results, it is considered that the site can be made suitable for residential land use, providing the following recommendations are carried out:

- Further assessment is completed in the southern portion of the site (6,000m^2 area), to provide a sampling density in accordance with the NSW EPA (1995) Sampling Design Guidelines. It is noted that if contamination is identified from this additional assessment, then a Remediation Action Plan (RAP) would be required, followed by remediation and validation.
- The assessment will need to include sufficient sampling to delineate the extent of the ACM present in the surface soils on the site. The sampling should be in accordance with ASC NEPM (2013) and the WA Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.
- An Asbestos Removal Plan will need to be prepared for removal of the ACM to landfill. The ACM would need to be removed by a Class B licensed asbestos removalist. This may comprise "hen-pecking" of ACM, or stripping of surface soils in the affected areas. The removal methodology would depend on the findings of the additional assessment.
- Following removal of the ACM, a clearance certificate would be required by a qualified hygienist or environmental scientist.
- Due to the former land use, an Unexpected Finds Procedure should be prepared and implemented during earthworks. The Unexpected Finds Procedure would provide guidance on identifying potentially contaminated materials, and procedures for handling and management of potentially contaminated materials.

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

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Attachments:

1.0 Introduction

Qualtest Laboratory NSW Pty Ltd (Qualtest) is pleased to present this Preliminary Contamination Assessment (PCA) report to Shaddock Architects for the proposed housing development located at 27-61 Nikko Road, Warnervale NSW (the site). The location of the site is shown on Figure 1, Appendix A.

The site is approximately 3.6ha in area, and is proposed to be developed into a 75-dwelling housing development. Central Coast Council (formerly Wyong Shire Council) indicated that the site may have been used for poultry farming in the past. Therefore, Council required a PCA as part of the Development Application (DA) submission.

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

1.1 Objectives

The objectives of the PCA were to provide a preliminary assessment of the potential for soil contamination to be present on the site.

1.2 Scope of Works

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

- Desk study and site history review to assess Areas of Environmental Concern (AECs) and associated Chemicals of Potential Concern (COPC);
- Excavation of four test pits (TP1 to TP4) and collection of soil samples;
- Collection of four surface soil samples (SS1 to SS4);
- Laboratory analysis of selected soil samples for the COPC identified; and
- Data assessment and preparation of a PCA 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 location:	27-61 Nikko Road, Warnervale NSW
Approximate site area:	3.6 hectares (ha)
Title Identification Details:	Lot 1 DP 349727, within the Central Coast (Wyong) local government area, Munmorah Parish in the county of Northumberland.
Current Ownership:	The title documents show the site is owned by George Alexander Wilson. It is understood that Kingston Property Fund No. 2 Pty Ltd have purchased the property since the titles documents were obtained.
Previous Landuse:	Chicken farm in the southern portion of the site. Undeveloped land in the central and northern portions of the site.
Current Landuse:	Predominately vacant land.
Proposed Landuse:	Residential housing development.
Adjoining Site Uses:	• Nikko Road to the west followed by the Main Northern Railway Line; • Kanowna Road to the south, followed by residential properties; • Residential properties to the south and east; and, • Bushland to the north.
Site Coordinates:	33°14'40 S 151°27'18 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 ranged from approximately 20m AHD in the central northern portion of the site and the eastern portion of the site to approximately 30m AHD at the southern extent of the site.

A survey plan was provided by Daly Smith Pty Ltd. The plan indicated that the northern portion of the site was at an elevation between about 18m AHD and 24m AHD, the central portion of the site was unable to be surveyed due to heavy bush/ swamp areas. From the southern boundary of the heavy bush covered area there was a consistent gentle slope to the south, ranging from approximately 19m AHD south of the heavy bush covered area, to 32m AHD on the southern site boundary.

Surface water would be expected to infiltrate into the site soils, with excess surface water draining to the "swamp" in the central-northern portion of the site. This area drains to the east, into an unnamed creek. The "swamp" appears to be a natural feature. There is also a dam in the south-east corner of the site, and surface water in the vicinity of the dam is anticipated to drain into the dam. Generally, surface water from the site is anticipated to flow towards the unnamed creek east of the site, which drains to another unnamed creek which flows to the south. This creek may eventually discharge to a wetland located about 3.2km south of the site.

2.3 Regional Geology

Reference to the 1:100,000 Gosford- Lake Macquarie Regional Geology Sheet (Sheet 9131 and part sheet 9231) indicates that the site is underlain by the Tuggerah Formation of the Narrabeen Group of Early Triassic age. The formation typically comprises laminate, claystone and siltstone, and sandstone.

2.4 Hydrogeology

Groundwater beneath the site is anticipated be present in semi-confined aquifers in weathered rock greater than 5m below ground surface (bgs). Groundwater beneath the site would be expected to follow the surface topography and flow towards the east. There is an unnamed creek present to the east of the site, which drains to another unnamed creek which flows to the south. This creek may eventually discharge to a wetland located about 3.2km south 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 are no registered bores within this radius. There were seven bores located between 520m and 1.3km from the site and a copy of the search is provided in Appendix D and summarised below in Table 2.2.

Table 2.2 – Summary of Groundwater Bore Data

Bore ID	Purpose	Approximate Distance & Direction from Site	Water Bearing Zone (m bgs)	Standing Water Level (m bgs)
GW080833	Test Bore	520m South East	NK	NK
GW200569	Test Bore	575m South East	NK	NK
GW200420	Test Bore	1.1km West	NK	NK
GW200419	Test Bore	1.2km West	NK	NK
GW200302	Test Bore	1.3km West	51.5 to 51.70	NK
GW200854	Monitoring Bore	1.2km West	2.30 to 2.90	2.30
GW200418	Test Bore	1.4km West	NK	NK

2.5 Acid Sulfate Soils

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

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;
- A review of aerial photography from the past 60 years;
- A site walkover to help identify current and previous activities carried out on the site, identify surrounding land uses, and assess AECs and COPCs;
- Interviews with people familiar with the site history; and,
- Search of the NSW EPA's list of contaminated sites applying to the site and nearby properties.

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

3.1 Historical titles search

A search of historical titles for the site was undertaken by Advanced Legal Searchers Pty Ltd. A list of past registered proprietors for the lot was obtained dating back to 1918. The results of the search are included in Appendix C and presented below in Table 3.1.

Table 3.1: Summary of historical titles

Date	Proprietor	Inferred Land Use
1989 - Present	George Alexander Wilson, (Farmer)	Agricultural/Farming
1960 -1989	George Alexander Wilson, (Farmer)	Agricultural/Farming
1958 - 1960	Edwin Noble Brooks, (Farmer) Majorie Reeve Brooks, (Farmers wife)	Agricultural/Farming
1951 - 1958	Eric Gordon Gibson, (Fisherman) Maurice John Green, (Shipwright)	Private/ Agricultural/Farming
1948 – 1951	George Masters, (Poultry farmer) Marguerite Masters, (Farmers wife)	Agricultural/Farming (Poultry)
1945 – 1948	Allan Campton, (School teacher)	Private
1918 – 1945	Albert Warner, (Esquire)	Private

The historical titles search indicated that the site was predominately owned by farmers from 1948 to present. The farming activities during this time are likely to have included poultry farming. Prior to 1948 the site was owned by a teacher and an esquire and the land use is unknown.

3.2 Aerial photograph review

Aerial photographs of the site from 1954, 1975 and 1984 were purchased from the Department of Land and Property Information, and satellite images from Google Earth for 2005 to 2017, 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 C.

Table 3.2: Aerial photograph review

Year	Site	Surrounding Land
1954	The northern portion of the site is covered by bushland. The southern portion of the site is largely cleared, and there are a number of structures in the south-west corner of the site, which may be associated with farming practices. The photograph is not clear enough to distinguish the number of structures. There appears to be a dam on the western boundary of the northern portion of the site.	The surrounding land is largely bushland. The Main Northern Railway is present to the west, and an access is present south of the site.
1975	There appear to be 12 structures, probably sheds, in the southern portion of the site. A dam has been constructed in the southeast portion of the site. The vegetation in northern portion of the site appears to have been thinned in some areas, and the dam on the western boundary is present.	There are areas of cleared land to the east and south of the site for rural-residential properties. The remainder of the surrounding area appears to be similar to the previous photograph.
1984	There are eight structures, probably sheds, in the southern portion of the site. The other four structures appear to have been removed. The remainder of the site appears to be similar to the 1975 photograph.	There has been further development to the south with more residential properties present. Properties to the west of the train lines have expanded. Infrastructure to the north of the site (Sparks Road) has been upgraded.
2005	There is one structure in the south west portion of the site, and the other structures appear to have been removed. The remainder of the site appears to be similar to the 1984 photograph.	Bushland to the south of the site has been developed into a residential area. There are more properties to the north west of the train lines. The remaining areas are similar to the previous photographs.
2016	The site appears similar to 2005 photograph. There appear to be waste materials to the north and west of the shed in the south-west portion of the site.	The surrounding land is similar to the previous photograph.

3.3 Site observations

A Qualtest Environmental Scientist carried out a site walkover on 27 June 2017. Selected site photographs are presented in Appendix E. The observations noted during the site walkover are summarised below:

- The northern and central portion of the site was densely vegetated with trees, grasses and ferns, and appeared to have been undisturbed by former site activities (see Photograph 1);
- The central area of the site sloped into a heavily vegetated swamp or dam, which had an inlet off Nikko Road, some rubbish was observed in this water system;
- Several areas of illegally dumped waste were observed, on the western boundary of the site, where the site is easily accessible from Nikko Road. The waste included bricks, concrete, plasterboard and medium-density fibreboard (MDF board) (see Photograph 3);
- The southern portion of the site had been cleared, and was vegetated with long grasses and weeds, and scattered trees (see Photograph 2).
- In the southwestern portion of the site a derelict abandoned shed was present. The shed was constructed of metal cladding and roof, and contained a number of gas cylinders (see Photograph 4). A pile of rubbish was present approximately 10m west of the shed and included appliances such as fridges, ovens and other metal objects, and plastic kids toys (see Photograph 5);
- A concrete slab, likely associated with a former building, was observed on the south-west corner of the site;
- An gravel driveway was present on the western side of the site to provide access from Nikko Road;
- A dam was constructed in the south-eastern portion of the site (see Photograph 6), and had a steep batter slope towards the eastern border of the site. This batter slope appeared steep before levelling out into natural sloping terrain.

3.4 NSW EPA records

A search of the NSW EPA database revealed that there was one property within the Warnervale area that was registered as having former notices. The property is a former timber treatment plant on the corner of Aidenham and Railway Roads. This property is about 1.2km distant from the site, and therefore contamination on this property is considered unlikely to impact the site. A copy of the search is provided in Appendix C.

3.5 Anecdotal information

The former owners daughter, Sue Mathews and her mother provided the following information:

- They have been familiar with the site for about 60 years;
- The southern portion of the site was used for chicken farming;
- The chickens were held for about 12 months and then on-sold;
- The few chickens which died on site were bagged and disposed of to landfill;
- No chemicals were used in the farming, with the exception of chicken worming tablets. These were stored in sheds in the southern part of the site;
- No waste was stored or disposed on site;
- The sheds used for chicken farming were not constructed with Asbestos Containing Materials (ACM). The residential house may possibly have contained some ACM;
- The buildings were demolished in about 1990;
- They are not aware of other past activities that may have caused contamination.

3.6 Section 149 Certificate

A Section 149 Certificate for the site was obtained from Wyong Shire Council (Central Coast Council). Relevant information is summarised below.

Zoning	R2 Low Density Residential E3 Environmental Management
Critical Habitat	Nil
Conservation Area	Nil
Environmental Heritage	Nil
Mine Subsidence	Not within a proclaimed district
Bushfire	Land is bushfire prone
Loose-fill Asbestos Insulation	*This land does not include any residential premises (within the meaning of Division 1A of Part 8 of the Home Building Act 1989) that are listed on the register that is required to be maintained under that Division. That register lists residential premises that contain or have contained loose-fill asbestos insulation.*
Contaminated Land Management Act 1997	Nil prescribed matters

3.7 Previous reports

No previous reports for the site have been provided to Qualtest.

3.8 Summary of site history

The information obtained from the site history review has been summarised below:

- Based on the information provided in the historical titles, aerial photographs and anecdotal information, the southern portion of the site was used for chicken farming from the 1940's until the 1990's. The area the chicken farming appears to have occurred in is about 6,000m^2.
- The anecdotal information indicates that the chicken farm buildings did not contain ACM, and that chemicals, other than worming tablets, were not stored or used on site, and wastes were not stored or buried on site.
- The anecdotal information indicated that the former house on the site may have contained ACM.
- The use of the site prior to the 1940's is unknown, but based on the site locations it is anticipated the site was undeveloped bushland.

3.9 Gaps in the Site History

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

- It is not known what activities were carried out prior to the 1940's, although based on land uses in the region at the time, the site was likely to have been undeveloped or used for grazing;
- The operations of the chicken farm (use of chemicals, disposal of waste) prior to about 1960 are not known.

4.0 Field and Laboratory Investigations

4.1 Sampling Plan

The NSW EPA (1995) Sampling Design Guidelines recommend a minimum of 40 to 45 sampling locations to characterise a site of 3.0 to 3.5 hectares. The portion of the site which appears to have been used for chicken farming is about 6,000m^2, located in the south-southwest portion of the site. The NSW EPA (1995) Sampling Design Guidelines recommend a minimum of 15 sampling locations to characterise an area of 6,000m^2.

Due to the preliminary nature of the assessment, at this stage eight sampling locations within the south-southwest portion of the site have been selected.

Soil samples were collected from four test pits (TP1 to TP4) and four surface samples (SS1 to SS4) which targeted the footprint of the former chicken farm buildings. Test pit TP2 was located in the footprint of the former building thought likely to be the former house. In the area of TP1, TP2, SS2 and SS4 an area about 3m by 3m was cleared of vegetation on the surface, and the topsoil raked by the excavator bucket teeth to assist in observations for potential asbestos containing materials (ACM). For SS2, this area was located about 0.5m to the east of the original SS2 location, and was designated SS2A.

One surface water sample (SW1) was collected from the dam in the southeast portion of the site.

4.2 Sampling

Soil samples were collected from the four test pits (TP1 to TP4) and four surface sample (SS1 to SS4) locations.

The test pits were excavated using a 5 tonne excavator. Soil samples from the test pits were collected directly from the excavator bucket at the surface and about 0.5m bgs.

The surface soil samples (SS1 to SS4) were collected by scraping the surface with the excavator due to the presence of long, dense grass. No re-usable sampling equipment was used.

Four sample locations were selected for asbestos testing, TP1 0.0-0.1m, TP2 0.0-0.1m, SS2A and SS4. The asbestos samples in these locations were collected by:

- Collection of a 10L sample in a bucket;
- Weighing of the 10L sample;
- Sieving the 10L sample through a 6.7mm sieve;
- Weighing of potential bonded ACM captured on the sieve (if any); and
- Collection of a 500mL wetted sample from the material that passed through the sieve.

The surface water sample was collected by dipping the sample bottles directly into the water. Field water quality measurements (pH, electrical conductivity, redox potential and temperature) were recorded.

A clean pair of disposable gloves was used whilst handling each new sample. The soil samples were placed into 250mL laboratory supplied glass jars and plastic zip-lock bags for laboratory analysis. The asbestos samples were placed into plastic bags. The water samples were placed into appropriately preserved laboratory supplied bottles. Each sample was placed directly into an ice-chilled esky and remained chilled during transportation to the laboratory.

4.3 Laboratory analysis

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

The soil samples were analysed for the following:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) – 8 primary soil samples;
- Total Recoverable Hydrocarbons (TRH) – 2 primary soil samples;
- Benzene, Toluene, Ethylbenzene and Xylene (BTEX) – 2 primary soil samples;
- Polycyclic Aromatic Hydrocarbons (PAHs) – 2 primary soil samples;
- Organochlorine and Organophosphorous Pesticides (OCP & OPP) – 4 primary soil samples;
- Phenoxy herbicides – 2 primary soil samples;
- Helminth ova pathogens – 2 primary soil samples;
- Formaldehyde – 1 primary soil sample;
- Faecal coliforms and E. Coli – 4 primary soil samples;
- Nutrients (total nitrogen and total phosphorous) – 8 primary soil samples;
- Ammonia - 8 primary soil samples;
- Asbestos (presence/absence) – 1 material samples of potential ACM, and one soil sample;
- Asbestos (quantitative) – 4 primary soil samples;
- pH – 1 primary soil sample; and,
- Cation Exchange Capacity (CEC) – 1 primary soil sample.

For quality control purposes, one duplicate sample was collected and analysed for metals, OCP, OPP, nutrients and ammonia, and one triplicate sample was collected and analysed for metals and ammonia. The triplicate sample was despatched by Eurofins MGT to ALS laboratory in Springvale, VIC.

The surface water sample was analysed for:

- Heavy Metals;
- OCP and OPP;
- Faecal coliforms and E. Coli;
- Nutrients (total nitrogen and total phosphorous); and,
- Ammonia.

5.0 Investigation Criteria

5.1 Soil

Health and Ecological Levels

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

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

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

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

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

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

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

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

The following criteria have been adopted:

- HIL A – low density residential land use;
- HSL A – low density residential land use, Sands, 0-1m depth; and,
- EIL A and ESL A – urban residential / public open space.

Asbestos in Soil

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

- Schedule B1 'Guideline on the Investigation Levels for Soil and Groundwater' of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC, 2013);
- Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA DoH, 2009).

Schedule B1, Section 4 of the ASC NEPM (NEPC 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.

In addition, there is a requirement for no visible asbestos to be present in the top 10cm of the site soils.

Microbiological Guidelines

To assess microbiological contamination in soil, investigation levels were adopted from the following reference:

- NSW EPA (2000) Environmental Guidelines: Use and Disposal of Biosolids Products (referred to here as the Biosolids Guidelines).

The NSW EPA (2000) Biosolids Guidelines provide stabilisation grade microbiological standards for E. coli and faecal coliforms. These standards relate to the minimum requirements for stabilisation of biosolid products, and can be used to assess if further treatment of biosolids is required. For assessment purposes, these standards have been adopted for this assessment.

5.2 Surface Water Investigation Levels

The applicable guidelines for assessing water quality in the dam are based on the following references:

- ANZECC (2000) Australian and New Zealand Guidelines on Fresh and Marine Water Quality.
- NSW DEC (2004) Use of Effluent by Irrigation

In order to assess which of the criteria are applicable for the site, the potential beneficial uses of surface water for the site and down-gradient of the site must be assessed.

Potential beneficial uses are considered to include:

- Aquatic ecosystems - discharge to surface water bodies with the nearest water body being an unnamed creek to the east of the site. These creeks are likely to sustain freshwater ecosystems.
- Extraction of the surface water around the site for drinking water is considered unlikely, due to the presence of reticulated water in the area.
- Extraction of the surface water around the site for irrigation use is considered possible for agricultural land uses.

Given the above, the potential beneficial use of surface water is considered to be sustaining aquatic ecosystems in the unnamed creeks east of the site, and irrigation use.

Protection of Aquatic Ecosystems

The trigger values for freshwater species presented in the ANZECC (2000) are considered applicable for the protection of aquatic ecosystems of the receiving waters.

ANZECC (2000) advocates a site-specific approach to developing guideline trigger values based on such factors as local biological affects data, the current level of disturbance of the ecosystem, etc. The guidelines present 'low risk guideline trigger values' which are defined as concentrations of key performance parameters below which there is a low risk that adverse biological effects will occur. It is important to note that these are not threshold values at which an environmental problem is likely to occur if exceeded. Rather, if the trigger values are exceeded, then further action is required which may include either, further site-specific investigations to assess whether or not there is an actual problem, or the implementation of management / remedial actions.

Low risk trigger values are provided for the protection of 80-99% of species in fresh waters (presented in Table 3.4.1 of ANZECC (2000) and Table 1C of ASC NEPM (2013)), with the trigger value depending on the health of the receiving waters.

It is considered that the fresh water trigger values are applicable for investigating chemical concentrations in surface water at the site, as the potential receiving body (unnamed creek east of the site) is a freshwater body.

Irrigation

Guidelines for irrigation water use are presented in the ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Section 4.2 of the guidelines). ANZECC (2000) presents long-term values (LTV) and short-term values (STV) for water used for irrigation purposes. The LTV is the maximum concentration of contaminants in irrigation water which can be tolerated assuming 100 years of irrigation while the STV is the maximum concentration of contaminant in the irrigation water that can be tolerated for a shorter period of time assuming 20 years of irrigation. The STV have been adopted for this assessment.

The long-term values have been adopted for the purpose of this investigation.

Microbiological

NSW DEC (2004) Use of Effluent by Irrigation guideline provides guidelines for concentrations of thermotolerant coliforms for the use of reclaimed water from municipal sewage treatment plants. The guidelines are based on different land use scenarios, including municipal land with and without public access, and agricultural. Whilst the water in the dam is not from a sewage treatment plant, the guidelines can be used to assess the risk to human health posed by the

concentrations of thermotolerant coliforms. The guideline adopted is for municipal with uncontrolled public access.

ANZECC (2000) provides guidelines water quality guidelines for microbiological characteristics for recreational use. The guidelines provided are for primary contact (water used for swimming) and secondary contact (not directly used for swimming). Secondary contact guidelines have been adopted for this assessment, as the risk scenario is similar.

6.0 Quality Assurance/Quality Control

A data validation report is presented in Appendix H. Sampling activities were undertaken in accordance with normal, industry accepted practices and standards. In order to assess field QA / QC procedures the following QA/QC samples were collected during the soil sampling programme:

Sample	Type	Laboratory	Analysis
QC1	Duplicate of TP3 0.0-0.1	Eurofins MGT	Metals, OCP, OPP, Nutrients, Ammonia
QC2	Triplicate of TP3 0.0-0.1	ALS	Metals, Ammonia

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

Table LR5 presents the relative percentage differences (RPDs) between the primary and duplicate samples. An acceptable range of 30% was adopted for duplicates. It is noted that low analytes concentrations exaggerate the percentage differences with respect to small total concentration differences, therefore where results for the primary and duplicate were less than 10 times the LOR, the RPDs have been disregarded.

The RPDs were within the acceptable range with the exception of copper in pair TP3 0.0-0.1 / QC2 (143%). The RPD exceedence is likely attributed to the distribution of copper within the topsoil material, which was located adjacent to a metal clad shed. Based on the other metals, and the duplicate sample, showing RPDs below 30%, this RPD is not considered to affect the usability of the results. The higher copper concentration has been adopted for the assessment.

No trip blank or trip spike samples were collected. As volatiles were not a primary chemical of concern, the absence of a trip blank is not considered to affect the data usability.

No rinsate samples were collected, as no re-useable sampling equipment was used. The samples were collected either directly from the excavator bucket or surface soils by hand (wearing nitrile gloves).

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 laboratory control limits, with the exception of one recovery for MCPA and PCPB (herbicides). Lab code Q08 was quoted: *"The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix Interference."* Based on this, the spike recovery is not considered to affect the usability of the results;
- Laboratory duplicate RPDs were recorded within the laboratory control limits, with the exception of numerous PAH compounds for one duplicate pair. Laboratory code Q15 was quoted: *'The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report'*. Based on this the RPD outliers for the PAH compounds is not considered to affect the usability of the results; and
- Surrogates and laboratory control samples were within the laboratories acceptable ranges.

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

7.0 Results

7.1 Subsurface Conditions

The test pit logs are presented in Appendix F. The soils observed during test pitting are summarised below in Table 7.1.

Table 7.1 – Summary of Soil Profile

Soil Type	Description	Depth Range (m bgs)
TOPSOIL	Clayey Sand, fine to medium grained, dark brown, root affected.	0.0 to 0.15
RESIDUAL SOIL	Sandy Clay and Clay, medium to high plasticity, light brown, brown and orange-brown. Often with some fine grained gravel comprising weathered sandstone.	0.15 to 0.55-1.0*

Test pits TP1, TP2 and TP4 reached refusal on weathered sandstone at 0.55m, 0.9m, and 0.8m respectively. Test pit TP3 was terminated in residual soil at 1.0m due to the limit of required investigation.

Test pit TP2 encountered what appeared to be concrete footings from a former building on the southern side of the test pit. Several fragments of potential ACM were encountered in this location, in the surface soils.

Surface sample SS4 was adjacent to a concrete slab, likely from a former building. One fragment of potential ACM was encountered in the surface soils in this location.

Potential ACM was not encountered in other locations. It is noted that the long, dense grass cover precluded observation of most of the site surface. Efforts were made to assess the presence of potential ACM in the surface soils at each of the sampling locations.

No odours or staining, or anthropogenic materials were observed during the test pitting and sampling, other than the potential ACM discussed above.

No groundwater inflows or seepage were noted during the test pitting.

7.2 Field Water Quality Results

Field water quality measurements were recorded for the surface water in the dam in the southeast portion of the site. The measurements are presented in Table 7.2 below.

Table 7.2 – Surface Water Field Quality Measurements

Sample	EC	pH	Redox	Temperature	Comments
SW1	174.2µS/cm	6.36	44.8mV	16.2°C	Clear with brown tinge. Some sediment present. The dam was vegetated with reeds.

7.3 Laboratory Results

Soil

Soil analytical results are summarised in Tables LR1 to Table LR3, Appendix B. The laboratory analytical reports are also included in Appendix G.

The soil laboratory results were compared to the investigation levels described in Section 5.0. The analytical results indicated that concentrations of contaminants were reported below the adopted criteria, with the exception of:

- Amosite and chrysotile asbestos were identified in the fragment of ACM tested. As each of the fragments of ACM collected were of the same material, it is inferred that each of the fragments would contain asbestos.
- Concentrations of zinc were reported above the adopted EIL criteria (230mg/kg) in samples TP2 0.0-0.1 (680mg/kg), TP3 0.0-0.1 (300mg/kg) and SS3 (810mg/kg); and
- Concentrations of copper were reported above the adopted EIL criteria (280mg/kg) in sample TP3 0.0-0.1 (389mg/kg).

95% Upper Confidence Limit Calculations

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

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

The 95% UCLs were not calculated for copper and zinc as the standard deviation was more than 50% of the adopted criteria (EIL). For zinc, two of the three exceedances were more than 2.5 times the adopted criteria (EIL).

Surface Water

Surface water analytical results are summarised in Table LR4, Appendix B. The laboratory analytical reports are also included in Appendix G.

The surface water laboratory results were compared to the investigation levels described in Section 5.0. The analytical results indicated that concentrations of contaminants were reported below the adopted criteria, with the exception of:

- Concentrations of copper were reported above the adopted trigger values for protection of aquatic ecosystems (0.0014mg/L) in sample SW1 (0.003mg/L); and,
- Concentrations of zinc were reported above the adopted trigger values for protection of aquatic ecosystems (0.008mg/L) in sample SW1 (0.056mg/L).

8.0 Conceptual Site Model

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

8.1 Potential Sources of Contamination

Table 8.1 (below) shows the areas of environmental concern (AECs) and associated Chemicals of Concern (COCs) identified for the site.

Table 8.1 – Potential AECs and COCs

AEC	Potentially Contaminating Activity	Potential COCs	Likelihood of Contamination	Sampling Undertaken
1. Use of part of the site for chicken farming.	Potential use of chemicals, potential burial of chicken carcasses and other wastes.	Heavy Metals, OCPs, OPPs, Nutrients, Ammonia, Formaldehyde, Coliforms and E. Coli, Pathogens	Medium	TP1 to TP4, SS1 to SS4
2. Former site buildings and structures.	Potential use of hazardous building materials.	Asbestos, lead, zinc	Medium to High	TP1 to TP4, SS1 to SS4
3. Fill materials.	Potential importation of fill of unknown origin and quality.	TRH, BTEX, PAH, Heavy metals, Asbestos, OCP, OPP	Low	TP1 to TP4, SS1 to SS4. Note, no fill observed.
4. Dams (surface water and sediments).	Potential contamination of dams from run-off from site.	Heavy Metals, OCPs, OPPs, Nutrients, Ammonia, Microbiologcal, Pathogens	Low	SW1

8.2 Potentially Affected Media, Receptors and Exposure Pathways

Table 8.2 summarises the potentially affected media, potential receptors to contamination, and potential and complete exposure pathways.

Table 8.2 – Summary of Potentially Affected Media, Receptors and Exposure Pathways

Consideration	Information
Potentially affected media	Soil Surface water Groundwater
Potential transport mechanisms & exposure pathways	Leaching of soil contaminants to surface water and/or groundwater Direct dermal contact with contaminated soil and surface water Inhalation asbestos fibres Ingestion of contaminated soil Surface water discharge to on-site dams and an unnamed creek which runs through the northern part of the site in a west to east direction
Potential receptors of contamination	***Site occupants & construction/maintenance workers*** Potential exposure via dermal contact with soil and surface water, ingestion of soil, or inhalation of asbestos fibres. Contact with groundwater is considered unlikely, taking into account the anticipated depth to groundwater (>5m bgs in a semi confined/confined aquifer), groundwater is not currently extracted on site for beneficial use, and the discharge zone appears to be a wetland over 3km south of the site. ***Surface water*** Contaminants could leach from soils into surface water and sediments in the onsite dams, and the unnamed creek. ***Groundwater*** Contaminants could leach from soils into groundwater. This is considered a low risk as groundwater is expected to be present at depths >5m bgs within a semi confined/confined aquifer.

8.3 Potential and Complete Exposure Pathways

Table 8.3 summarises the potential and complete exposure pathways.

Table 8.3 – Potential and Complete Exposure Pathways

Receptor/Media	Exposure Pathway	Comment
Site occupants and construction/maintenance workers	Complete	There is a potential for site users and workers to be exposed to contaminated soil. No soil contamination was identified, however the assessment at this stage is preliminary, and therefore assessment of whether the exposure pathway is incomplete is impractical. Fragments of bonded ACM were identified on the site surface, and the exposure pathway to site occupants and workers is complete.
Surface water ecosystems and users	Partially complete	Copper and zinc concentrations above the aquatic ecosystems triggers values were identified in the onsite dam. The dam would not be expected to drain off-site, except during heavy rainfall. Based on this, it is considered that no exposure pathway exists between the dam and offsite unnamed creeks. The central-northern part of the site includes a "swamp" which drains to an unnamed creek present to the east of the site. This drains to another unnamed creek which flows to the south. This creek may eventually discharge to a wetland located about 3.2km south of the site. Run-off from the site may drain to the "swamp" and then off-site into the unnamed creek. Concentrations of copper and zinc were identified above the EILs in soils in the southern portion of the site. Taking into account the distance between these sampling locations and the "swamp" (100m), it is considered that a partial exposure pathway probably exists.
Groundwater users	Incomplete	Groundwater is anticipated to be at depths >5m. The soil contamination identified comprised surface soils with copper and zinc above the EILs. Therefore, a complete exposure pathway probably does not exist.

9.0 Discussion

The site history review showed that an area about 6,000m^2 in the southern portion of the site was used for chicken farming from about the 1940's until the 1990's. Prior to this the site was likely to have remained as undeveloped bushland.

Four AECs were identified for the site, relating to: use of the site for chicken farming; use of hazardous building materials; use of fill of unknown origin and quality; and surface water and sediments in onsite dams.

Sampling and analysis targeted these AECs. It is noted the sampling density in the area of concern, the 6,000m^2 area in the southern portion of the site did not meet the NSW EPA (1995) Sampling Design Guidelines due to the preliminary nature of the assessment.

No fill or buried waste materials were identified in the four test pits excavated, and there was no obvious evidence of the use of fill materials, or burial of wastes, on the site. Fragments of ACM were observed in surface soils in two locations on the site: in test pit TP2 in the footprint of what was considered likely to be the former house, and in surface sample SS4 adjacent to a concrete slab from a former shed. Several fragments were observed in the TP2 location, one fragment was observed in the SS4 location.

The laboratory results reported concentrations of copper and zinc above the adopted EILs in surface soils three locations, TP2, TP3 and SS3. Taking into account that the site is currently densely vegetated, it is considered that the exceedance of the EILs is unlikely to preclude future occupants to grow gardens.

Laboratory analysis showed the ACM fragments contained amosite and chrysotile asbestos. Samples collected in these locations showed asbestos was below the HSL for asbestos. It is noted that there is also a requirement for no visible asbestos in the top 10cm of the site surface.

10.0 Conclusions and Recommendations

Based on the site history and laboratory results, it is considered that the site can be made suitable for residential land use, providing the following recommendations are carried out:

- Further assessment is completed in the southern portion of the site (6,000m^2 area), to provide a sampling density in accordance with the NSW EPA (1995) Sampling Design Guidelines. It is noted that if contamination is identified from this additional assessment, then a Remediation Action Plan (RAP) would be required, followed by remediation and validation.
- The assessment will need to include sufficient sampling to delineate the extent of the ACM present in the surface soils on the site. The sampling should be in accordance with ASC NEPM (2013) and the WA Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia.
- An Asbestos Removal Plan will need to be prepared for removal of the ACM to landfill. The ACM would need to be removed by a Class B licensed asbestos removalist. This may comprise "hen-pecking" of ACM, or stripping of surface soils in the affected areas. The removal methodology would depend on the findings of the additional assessment.
- Following removal of the ACM, a clearance certificate would be required by a qualified hygienist or environmental scientist.
- Due to the former land use, an Unexpected Finds Procedure should be prepared and implemented during earthworks. The Unexpected Finds Procedure would provide guidance on identifying potentially contaminated materials, and procedures for handling and management of potentially contaminated materials.

If soils are proposed to be re-used or disposed offsite, they will require further assessment. The natural soils (excluding topsoil) may be able to be classified as Virgin Excavated Natural Material (VENM). Other materials may be suitable for assessment as Excavated Natural Material (ENM) under the Resource Recovery Order/Exemption under Part 9, Clause 91 to 93 of the POEO (Waste) Regulation, or they may require waste classification in accordance with the NSW EPA (2014) Waste Classification Guidelines, and disposal to an appropriate licensed landfill or facility.

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 conditions of the site.

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

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

Och D.J., Jones D.C., Uren R.E. & Hughes K.S. (Compilers) (2015) Gosford – Lake Macquarie Special 1:100 000 Geological Sheet, Sheet 9131 & part sheet 9231. Geological Survey of New South Wales, Sydney.

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

NSW Department of Primary Industries (Office of Water) Registered Groundwater Bore Map, accessed from http://allwaterdata.water.nsw.gov.au/water.stm, accessed on 26 June 2017.

NSW Land and Property Information, Spatial Information eXchange (SIX) Maps - Topographic Map, accessed from https://maps.six.nsw.gov.au/, accessed on 26 June 2017.

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

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

NSW EPA (1995) Sampling Design Guidelines

APPENDIX A:

Figures

Figure based on Sixmaps. (https://maps.six.nsw.gov.au)

Qualtest LABORATORY (NSW) PTY LTD	Client:	KINGSTON PROPERTY FUND NO. 2 PTY LTD	Drawing No:	FIGURE 1
	Project:	PROPOSED SUBDIVISION	Project No:	NEW17P-0106
	Location:	27-61 NIKKO ROAD, WARNERVALE NSW	Scale:	N.T.S.
	Title:	APPROXIMATE SITE LOCATION	Date:	18/07/2017

LEGEND:

Approximate test pit location

Approximate surface sample location

Figure based on Sixmaps. (https://maps.six.nsw.gov.au)

Client:	KINGSTON PROPERTY FUND NO. 2 PTY LTD	Drawing No:	FIGURE 2
Project:	PROPOSED SUBDIVISION	Project No:	NEW17P-0106
Location:	27-61 NIKKO ROAD, WARNERVALE NSW	Scale:	N.T.S.
Title:	SAMPLE LOCATION PLAN	Date:	18/07/2017

Qualtest LABORATORY (NSW) PTY LTD

APPENDIX B:

Tables

Kingston Property Fund No. 2 Pty Ltd
NEW17P-0106

Table LR1: Soil Analytical Results - TRH, BTEX, PAH, Metals
27-61 Nikko Rd, Warnervale

Qualtest LABORATORY (NSW) PTY LTD

						Field ID	TP1 0.0-0.1	TP2 0.0-0.1	TP3 0.0-0.1	TP4 0.0-0.1	SS1	SS2	SS3	SS4
						Date	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017
Analytes		Units	EQL	HIL-A [1]	HSL A [2]	EIL A/ESL A [3]								
Metals	Arsenic	mg/kg	2	100		100	< 2	< 2	2.6	3.4	< 2	< 2	2.7	4.5
	Cadmium	mg/kg	0.4	20			< 0.4	0.6	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium	mg/kg	5	100		190*	< 5	7.4	5.5	5.9	< 5	< 5	6.8	9.2
	Copper	mg/kg	5	6000		280*	< 5	22	389	5.7	< 5	5.3	13	17
	Lead	mg/kg	5	300		1100	< 5	87	41	40	11	9.7	25	47
	Mercury	mg/kg	5	40			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1
	Nickel	mg/kg	5	400		30*	< 5	< 5	< 5	< 5	< 5	< 5	6.4	< 5
	Zinc	mg/kg	5	7400		230*	21	680	300	160	51	160	810	120
pH & CEC	pH (1:5 Aqueous extract)	ph units	0.1				-	-	-	7.1	-	-	-	-
	Cation exchange capacity	meq/100g	0.05				-	-	-	4.1	-	-	-	-
PAHs	Acenaphthene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Acenaphthylene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Anthracene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Benz(a)anthracene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Benzo(a)pyrene	mg/kg	0.5			0.7	-	-	< 0.5	-	-	-	-	< 0.5
	Benzo(a)pyrene TEQ	mg/kg	0.6	3			-	-	0.6	-	-	-	-	0.6
	Benzo(b&j)fluoranthene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Benzo(g.h.i)perylene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Chrysene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Dibenz(a.h)anthracene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Fluoranthene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Fluorene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Naphthalene	mg/kg	0.5			170	-	-	< 0.5	-	-	-	-	< 0.5
	Phenanthrene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Pyrene	mg/kg	0.5				-	-	< 0.5	-	-	-	-	< 0.5
	Total PAH	mg/kg	0.5	300			-	-	< 0.5	-	-	-	-	< 0.5
BTEX	Benzene	mg/kg	0.1		0.5	50	-	-	< 0.1	-	-	-	-	< 0.1
	Ethylbenzene	mg/kg	0.1		55	70	-	-	< 0.1	-	-	-	-	< 0.1
	Toluene	mg/kg	0.1		160	85	-	-	< 0.1	-	-	-	-	< 0.1
	Xylenes	mg/kg	0.3		40	105	-	-	< 0.3	-	-	-	-	< 0.3
TRH	Naphthalene	mg/kg	0.5		3		-	-	< 0.5	-	-	-	-	< 0.5
	TRH C6-C10	mg/kg	20			180	-	-	< 20	-	-	-	-	< 20
	TRH C6-C10 less BTEX (F1)	mg/kg	20		45		-	-	< 20	-	-	-	-	< 20
	TRH >C10-C16	mg/kg	50			120	-	-	< 50	-	-	-	-	< 50
	TRH >C10-C16 less Naphthalene (F2)	mg/kg	50		110		-	-	< 50	-	-	-	-	< 50
	TRH >C16-C34	mg/kg	100			300	-	-	< 100	-	-	-	-	< 100
	TRH >C34-C40	mg/kg	100			2800	-	-	< 100	-	-	-	-	< 100

Notes

* Based on a pH of 7.1 a CEC of 4.1meq/100g and clay content of 1%.

\- Not analysed

Result Concentration exceeds adopted human health critieria

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

Result Concentration exceeds adopted ecological investigation and screening levels - Residential, Sand

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

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

3 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Ecological Investigation and Screening Levels (Residential)

Kingston Property Fund No. 2 Pty Ltd
NEW17P-0106

Table LR2: Soil Analytical Results - OCP, OPP, Herbicides
27-61 Nikko Rd, Warnervale

						Field ID	TP1 0.0-0.1	TP2 0.0-0.1	TP3 0.0-0.1	SS4
						Date	5/07/2017	5/07/2017	5/07/2017	5/07/2017
Analytes		Units	EQL	HIL-A [1]	EIL A/ESL A [2]					
OCPs	4.4'-DDD	mg/kg	0.05	240			< 0.05	< 0.05	< 0.05	< 0.05
	4.4'-DDE	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	4.4'-DDT	mg/kg	0.05		180		< 0.05	< 0.05	< 0.05	< 0.05
	a-BHC	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Aldrin	mg/kg	0.05	6			< 0.05	< 0.05	< 0.05	< 0.05
	Dieldrin	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	b-BHC	mg/kg	0.05				< 0.1	< 0.1	< 0.1	< 0.1
	Chlordanes - Total	mg/kg	0.1	50			< 0.05	< 0.05	< 0.05	< 0.05
	d-BHC	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Endosulfan I	mg/kg	0.05	270			< 0.05	< 0.05	< 0.05	< 0.05
	Endosulfan II	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Endosulfan sulphate	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Endrin	mg/kg	0.05	10			< 0.05	< 0.05	< 0.05	< 0.05
	Endrin aldehyde	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Endrin ketone	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	g-BHC (Lindane)	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Heptachlor	mg/kg	0.05	6			< 0.05	< 0.05	< 0.05	< 0.05
	Heptachlor epoxide	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Hexachlorobenzene	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
	Methoxychlor	mg/kg	0.2	300			< 0.05	< 0.05	< 0.05	< 0.05
	Toxaphene	mg/kg	1	20			< 1	< 1	< 1	< 1
OPPs	Azinphos-methyl	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Bolstar	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Chlorfenvinphos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Chlorpyrifos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Chlorpyrifos-methyl	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Coumaphos	mg/kg	2				< 2	< 2	< 2	< 2
	Demeton-O	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Demeton-S	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Diazinon	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Dichlorvos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Dimethoate	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Disulfoton	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	EPN	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Ethion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Ethoprop	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Ethyl parathion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Fenitrothion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Fensulfothion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Fenthion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Malathion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Merphos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Methyl parathion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Mevinphos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Monocrotophos	mg/kg	2				< 2	< 2	< 2	< 2
	Naled	mg/kg	2				< 0.2	< 0.2	< 0.2	< 0.2
	Omethoate	mg/kg	0.2				< 2	< 2	< 2	< 2
	Phorate	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Pirimiphos-methyl	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Pyrazophos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Ronnel	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Terbufos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Tetrachlorvinphos	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Tokuthion	mg/kg	0.2				< 0.2	< 0.2	< 0.2	< 0.2
	Trichloronate	mg/kg	0.6				< 0.2	< 0.2	< 0.2	< 0.2
Herbicides	2.4.5-T	mg/kg	0.5	600			-	< 0.5	-	< 0.5
	2.4.5-TP	mg/kg	0.5				-	< 0.5	-	< 0.5
	2.4-D	mg/kg	0.5	900			-	< 0.5	-	< 0.5
	2.4-DB	mg/kg	0.5				-	< 0.5	-	< 0.5
	Actril (loxynil)	mg/kg	0.5				-	< 0.5	-	< 0.5
	Dicamba	mg/kg	0.5				-	< 0.5	-	< 0.5
	Dichlorprop	mg/kg	0.5				-	< 0.5	-	< 0.5
	Dinitro-o-cresol	mg/kg	0.5				-	< 0.5	-	< 0.5
	Dinoseb	mg/kg	0.5				-	< 0.5	-	< 0.5
	MCPA	mg/kg	0.5	600			-	< 0.5	-	< 0.5
	MCPB	mg/kg	0.5	600			-	< 0.5	-	< 0.5
	Mecoprop	mg/kg	0.5	600			-	< 0.5	-	< 0.5

Notes

- Not analysed

Result Concentration exceeds adopted human health critieria

Result Concentration exceeds adopted ecological investigation levels - Residential

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

2 NEPC (2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) - Ecological Investigation and Scre

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NEW17P-0106

Table LR3: Soil Analytical Results - Microbiological, Pathogens
27-61 Nikko Rd, Warnervale

					Field ID	TP1 0.0-0.1	TP2 0.0-0.1			TP3 0.0-0.1	TP4 0.0-0.1	SS1	SS2	SS2A	SS3	SS4
						Soil	Fragment ACM	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					Date	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017	5/07/2017
Analytes		Units	EQL	HSL A[1]	Biosolids[2]											
Nutrients	Ammonia (as N)	mg/kg	2			5	-	-	5	< 5	< 5	< 5	< 5	-	5.3	< 5
	Nitrate & Nitrite (as N)	mg/kg	0.4			< 5	-	-	< 5	< 5	< 5	< 5	< 5	-	< 5	< 5
	Phosphorus	mg/kg	5			670	-	-	1100	360	800	640	950	-	5000	790
	Total Kjeldahl Nitrogen (as N)	mg/kg	5			2900	-	-	3900	2600	1400	4100	3400	-	4600	2600
	Total Nitrogen (as N)	mg/kg	5			2900	-	-	3900	2600	1400	4100	3400	-	4600	2600
Pathogens	Helminth Ova	ova per 10g soil	5		<1 per 4g	-	-	-	-	-	<1	-	-	-	-	<1
	E.coli	MPN per g soil	0.1		<100	-	-	-	<10	<10^	<10	-	-	-	-	<10
	Thermotolerant Coliforms	MPN per g soil	0.05		<1000	-	-	-	10	74^	52	-	-	-	-	<10
	Formaldehyde	mg/kg	0.5			-	-	-	-	-	-	-	-	-	-	< 10
Asbestos	Asbestos (presence/absence	detected		detected		-	detected	ND	-	-	-	-	-	-	-	
	Asbestos (AF & FA quantitative)	% w/w	0.001	0.001		<0.001	-	-	<0.001	-	-	-	-	<0.001	-	<0.001
	Asbestos (ACM quantitative)*	% w/w		0.01		ND	-	-	0.007	-	-	-	-	ND	-	0.006

Notes

* Assessed and calculated by Qualtest: % w/w asbestos in soil = (% bonded ACM (kg) / soil volume (L)) x soil density (kg/L)

\- Not analysed

^ Results for sample QC1, duplicate of TP3 0.0-0.1

ND Not detected

Result Concentration exceeds adopted health screening level, Asbestos (Residential)

Result Concentrations exceeds Microbiological/Pathogen adopted criteria

1 NEPC (2013) Soil Health Screening Levels for Asbestos, Residential A

2 NSW EPA (2000) Use and Disposal of Biosolids Products, Table 3.4 Initial Process Verification Standards, Table 3.5 Stabilisation Grade A Microbiological Standards

Table LR4: Surface Water Analytical Results
27-61 Nikko Rd, Warnervale

					Field ID	SW1
					Date	5/07/2017
Analytes		Units	EQL	Aquatic Ecosystem	Irrigation	
Nutrients	Ammonia (as N)	mg/L	2	0.9		0.04
	Nitrate & Nitrite (as N)	mg/L	0.4			0.06
	Phosphate total (as P)	mg/L	5	0.01*	0.8	0.1
	Total Kjeldahl Nitrogen (as N)	mg/L	5			0.6
	Total Nitrogen (as N)	mg/L	5	0.35*	25	0.7
Metals	Arsenic	mg/L	5	0.013	2	< 0.001
	Cadmium	mg/L	0.1	0.0002	0.05	< 0.0002
	Chromium	mg/L	0.05	0.001	1	< 0.001
	Copper	mg/L	0.5	0.0014	5	0.003
	Lead	mg/L		0.0034	5	< 0.001
	Mercury	mg/L	0.001	0.00006	0.002	*< 0.0001*
	Nickel	mg/L		0.011	2	0.002
	Zinc	mg/L		0.008	5	0.056
OCP	4.4'-DDD	mg/L				< 0.0001
	4.4'-DDE	mg/L				< 0.0001
	4.4'-DDT	mg/L		0.006		< 0.0001
	a-BHC	mg/L				< 0.0001
	Aldrin	mg/L				< 0.0001
	Dieldrin	mg/L		0.0003^		< 0.0001
	b-BHC	mg/L				< 0.0001
	Chlordanes - Total	mg/L		0.03		< 0.001
	d-BHC	mg/L				< 0.0001
	Endosulfan I	mg/L				< 0.0001
	Endosulfan II	mg/L		0.03		< 0.0001
	Endosulfan sulphate	mg/L				< 0.0001
	Endrin	mg/L		0.01		< 0.0001
	Endrin aldehyde	mg/L				< 0.0001
	Endrin ketone	mg/L				< 0.0001
	g-BHC (Lindane)	mg/L		0.2		< 0.0001
	Heptachlor	mg/L		0.01		< 0.0001
	Heptachlor epoxide	mg/L		0.0003^		< 0.0001
	Hexachlorobenzene	mg/L				< 0.0001
	Methoxychlor	mg/L				< 0.0001
	Toxaphene	mg/L		0.1		< 0.01
OPP	Azinphos-methyl	mg/L		0.03^		< 0.002
	Bolstar	mg/L				< 0.002
	Chlorfenvinphos	mg/L		0.02^		< 0.002
	Chlorpyrifos	mg/L		0.01		< 0.02
	Chlorpyrifos-methyl	mg/L				< 0.002
	Coumaphos	mg/L				< 0.02
	Demeton-O	mg/L				< 0.002
	Demeton-S	mg/L				< 0.02
	Diazinon	mg/L		0.01		< 0.002
	Dichlorvos	mg/L		0.005^		< 0.002
	Dimethoate	mg/L		0.15		< 0.002
	Disulfoton	mg/L		0.004^		< 0.002
	EPN	mg/L				< 0.002
	Ethion	mg/L		0.004^		< 0.002
	Ethoprop	mg/L				< 0.002
	Ethyl parathion	mg/L				< 0.002
	Fenitrothion	mg/L		0.2		< 0.002
	Fensulfothion	mg/L				< 0.002
	Fenthion	mg/L				< 0.002
	Malathion	mg/L		0.05		< 0.002
	Merphos	mg/L				< 0.002
	Methyl parathion	mg/L				< 0.002
	Mevinphos	mg/L		0.006^		< 0.002
	Monocrotophos	mg/L				< 0.002
	Naled	mg/L				< 0.002
	Omethoate	mg/L		0.001^		*< 0.002*
	Phorate	mg/L				< 0.002
	Pirimiphos-methyl	mg/L		0.09^		< 0.02
	Pyrazophos	mg/L		0.02^		< 0.002
	Ronnel	mg/L				< 0.002
	Terbufos	mg/L		0.0009^		*< 0.002*
	Tetrachlorvinphos	mg/L				< 0.002
	Tokuthion	mg/L				< 0.002
	Trichloronate	mg/L				< 0.002
Microbiological	E.coli	MPN/100ml		230		2
	Thermotolerant Coliforms	MPN/100ml		1000	10	3

Notes:

Concentration exceeds the Protection of 95-99% of species in Freshwater trigger values

Concentration exceeds the Irrigation trigger values

Italics LOR exceeds adopted criteria

* Criteria from Table 3.3.2, South-east Australia, Freshwater lakes and reservoirs

1 ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality - Table 3.4.1 Freshwater 95% -99% of species

2 ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality - Table 4.2.10 Irrigation trigger values, short-term

3 NSW DEC (2004) Use of Effluent for Irrigation, Appendix 1, Table A1, Municipal with uncontrolled access

^ Criteria from NHMRC (2011) Australian Drinking Water Guidelines

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Table LR5: Quality Control Results - Duplicates
27-61 Nikko Rd, Warnervale

			Field ID	TP3 0.0-0.1	QC1		TP3 0.0-0.1	QC2	
			Date	5/07/2017	5/07/2017	RPD%	5/07/2017	5/57/17	RPD%
			Comments	Duplicate			Triplicate		
Analytes		Units	EQL						
Heavy Metals	Arsenic	mg/kg	2	2.6	2.1	21	2.6	<5	0
	Cadmium	mg/kg	0.4	< 0.4	< 0.4	0	< 0.4	<1	0
	Chromium	mg/kg	5	5.5	< 5	0	5.5	6	9
	Copper	mg/kg	5	64	41	44	**64**	**389**	**143**
	Lead	mg/kg	5	41	37	10	41	75	59
	Mercury	mg/kg	5	< 0.1	< 0.1	0	< 0.1	< 0.1	0
	Nickel	mg/kg	5	< 5	< 5	0	< 5	5	0
	Zinc	mg/kg	5	300	280	7	300	274	9
Nutrients	Ammonia (as N)	mg/kg	2	< 5	<5	0	< 5	<20	-
	Nitrate & Nitrite (as N)	mg/kg	0.4	< 5	<5	0	< 5	-	-
	Phosphorus	mg/kg	5	360	330	9	360	-	-
	Total Kjeldahl Nitrogen (as N)	mg/kg	5	2600	2400	8	2600	-	-
	Total Nitrogen (as N)	mg/kg	5	2600	2400	8	2600	-	-
OCPs	4.4'-DDD	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	4.4'-DDE	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	4.4'-DDT	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	a-BHC	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Aldrin	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Dieldrin	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	b-BHC	mg/kg	0.05	< 0.1	< 0.1	0	< 0.1	-	-
	Chlordanes - Total	mg/kg	0.1	< 0.05	< 0.05	0	< 0.05	-	-
	d-BHC	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Endosulfan I	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Endosulfan II	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Endosulfan sulphate	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Endrin	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Endrin aldehyde	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Endrin ketone	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	g-BHC (Lindane)	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Heptachlor	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Heptachlor epoxide	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Hexachlorobenzene	mg/kg	0.05	< 0.05	< 0.05	0	< 0.05	-	-
	Methoxychlor	mg/kg	0.2	< 0.05	< 0.05	0	< 0.05	-	-
	Toxaphene	mg/kg	1	< 1	< 1	0	< 1	-	-
OPPs	Azinphos-methyl	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Bolstar	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Chlorfenvinphos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Chlorpyrifos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Chlorpyrifos-methyl	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Coumaphos	mg/kg	2	< 2	< 2	0	< 2	-	-
	Demeton-O	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Demeton-S	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Diazinon	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Dichlorvos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Dimethoate	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Disulfoton	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	EPN	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Ethion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Ethoprop	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Ethyl parathion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Fenitrothion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Fensulfothion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Fenthion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Malathion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Merphos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Methyl parathion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Mevinphos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Monocrotophos	mg/kg	2	< 2	< 2	0	< 2	-	-
	Naled	mg/kg	2	< 0.2	< 0.2	0	< 0.2	-	-
	Omethoate	mg/kg	0.2	< 2	< 2	0	< 2	-	-
	Phorate	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Pirimiphos-methyl	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Pyrazophos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Ronnel	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Terbufos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Tetrachlorvinphos	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Tokuthion	mg/kg	0.2	< 0.2	< 0.2	0	< 0.2	-	-
	Trichloronate	mg/kg	0.6	< 0.2	< 0.2	0	< 0.2	-	-

*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:

Site History Searches

Aerial Photograph March 1954

Approximate site boundary

Aerial Photograph May 1975

Approximate site boundary

Aerial Photograph September 1984

Approximate site boundary

Aerial Photograph 2005 (Google Earth)

Approximate site boundary

Aerial Photograph 2017 (Google Earth)

Approximate site boundary

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

21st June, 2017

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

Attention: Emma Coleman

RE: **26 – 61 Nikko Road,**
Warnervale

Current Search

Folio Identifier 1/349727 (title attached)
DP 349727 (plan attached)
Dated 20th June, 2017
Registered Proprietor:
GEORGE ALEXANDER WILSON

Title Tree
Lot 1 DP 349727

Folio Identifier 1/349727

Certificate of Title Volume 5493 Folio 166

Certificate of Title Volume 5029 Folio 149

Certificate of Title Volume 2878 Folio 194

****

Summary of proprietor(s)
Lot 1 DP 349727

Year	Proprietor(s)
	(**Lot 1 DP 349727)**
1989 – todate	George Alexander Wilson, farmer
	(**Lot 1 DP 349727 – Area 8 Acres 3 Roods 22 ¼ Perches – CTVol 5493 Fol 166)**
1960 – 1989	George Alexander Wilson, farmer
1958 – 1960	Edwin Noble Brooks, farmer Marjorie Reeve Brooks, his wife
1951 – 1958	Eric Gordon Gibson, fisherman Maurice John Green, shipwright
1948 – 1951	George Constantine Masters, poultry farmer Marguerite Valinda Masters, his wife
1945 – 1948	Allan Campton, school teacher
	(Portion 33, 32, Part 12, 30, 31 & 40 Parish Munmorah – Area 832 Acres 32 Perches – CTVol 5029 Fol 149)
1939 – 1945	Albert Hamlyn Warner, esquire
	(Portion 33, 32, Part 12, 30, 31 & 40 Parish Munmorah – Area 996 Acres 1 Rood 11 Perches – CTVol 2878 Fol 194)
1918 – 1939	Albert Hamlyn Warner, esquire

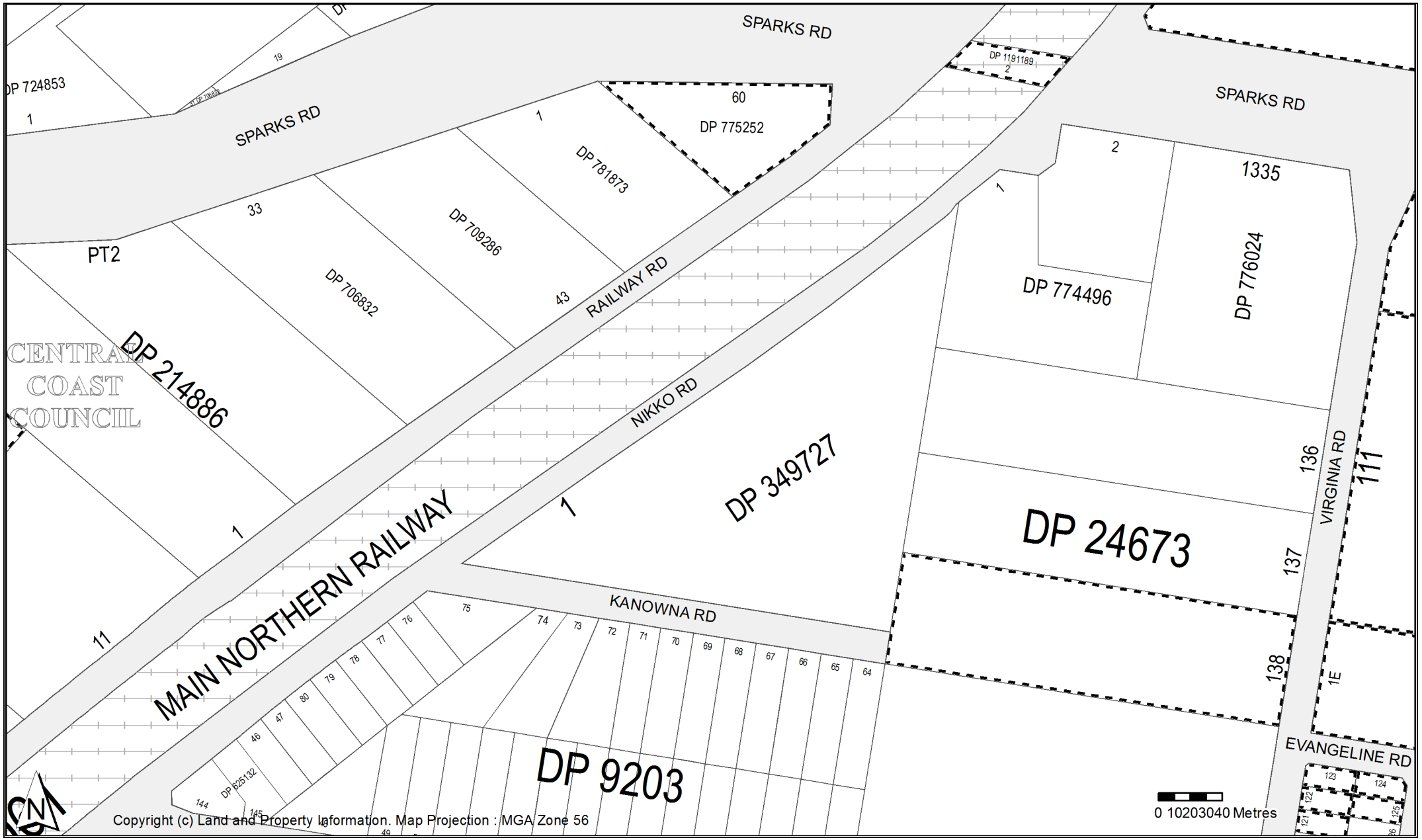
****

Cadastral Records Enquiry Report

Ref : qualtest - warnervale

Requested Parcel : Lot 1 DP 349727 **Identified Parcel :** Lot 1 DP 349727

Locality : WARNERVALE **LGA :** CENTRAL COAST **Parish :** MUNMORAH **County :** NORTHUMBERLAND



Requested Parcel : Lot 1 DP 349727 **Identified Parcel :** Lot 1 DP 349727

Locality : WARNERVALE **LGA :** CENTRAL COAST **Parish :** MUNMORAH **County :** NORTHUMBERLAND

	Status	Surv/Comp	Purpose
DP21495			
Lot(s): 4			
DP1222331	PRE-ALLOCATED	UNAVAILABLE	SUBDIVISION
DP24673			
Lot(s): 1E			
DP1142588	REGISTERED	SURVEY	RESUMPTION OR ACQUISITION
Lot(s): 138			
DP1007862	REGISTERED	COMPILATION	EASEMENT
DP705880			
Lot(s): 111			
DP1142588	REGISTERED	SURVEY	RESUMPTION OR ACQUISITION
DP748588			
Lot(s): 3			
DP1142588	REGISTERED	SURVEY	RESUMPTION OR ACQUISITION
DP775252			
Lot(s): 60			
DP1075801	REGISTERED	COMPILATION	EASEMENT
DP1191189			
Lot(s): 2			
CA170156 - LOT 2 DP1191189			
DP1198972			
Lot(s): 31			
DP7738	HISTORICAL	SURVEY	UNRESEARCHED
DP700096	HISTORICAL	COMPILATION	CONSOLIDATION
DP1142588	REGISTERED	SURVEY	RESUMPTION OR ACQUISITION
DP1197341	REGISTERED	SURVEY	CONSOLIDATION
DP1229987			
Lot(s): 121, 122, 123, 124, 125			
DP559441	HISTORICAL	SURVEY	SUBDIVISION
DP1142588	REGISTERED	SURVEY	RESUMPTION OR ACQUISITION

Caution: For all **ACTIVITY PRIOR to SEPT 2002** you must refer to the RGs Charting and Reference Maps.

Requested Parcel : Lot 1 DP 349727 **Identified Parcel :** Lot 1 DP 349727

Locality : WARNERVALE **LGA :** CENTRAL COAST **Parish :** MUNMORAH **County :** NORTHUMBERLAND

Plan	Surv/Comp	Purpose
DP7091	SURVEY	UNRESEARCHED
DP9203	SURVEY	UNRESEARCHED
DP21495	SURVEY	UNRESEARCHED
DP24673	SURVEY	UNRESEARCHED
DP214886	SURVEY	SUBDIVISION
DP349727	SURVEY	UNRESEARCHED
DP625132	SURVEY	SUBDIVISION
DP705440	SURVEY	ROADS ACT, 1993
DP705880	COMPILATION	CONSOLIDATION
DP706832	SURVEY	SUBDIVISION
DP708124	SURVEY	SUBDIVISION
DP709286	SURVEY	SUBDIVISION
DP724853	COMPILATION	DEPARTMENTAL
DP748588	COMPILATION	CONSOLIDATION
DP774496	SURVEY	SUBDIVISION
DP775252	SURVEY	SUBDIVISION
DP776024	COMPILATION	CONSOLIDATION
DP781873	COMPILATION	DEPARTMENTAL
DP940496	COMPILATION	UNRESEARCHED
DP1188061	COMPILATION	DEPARTMENTAL
DP1191189	COMPILATION	LIMITED FOLIO CREATION
DP1198972	SURVEY	SUBDIVISION
DP1229987	SURVEY	SUBDIVISION

D 356729 "A" D356729 F.P.349727

Plan Form No. 6 (for transfers, leases, etc.)

~~Municipality of~~ Shire of Erina

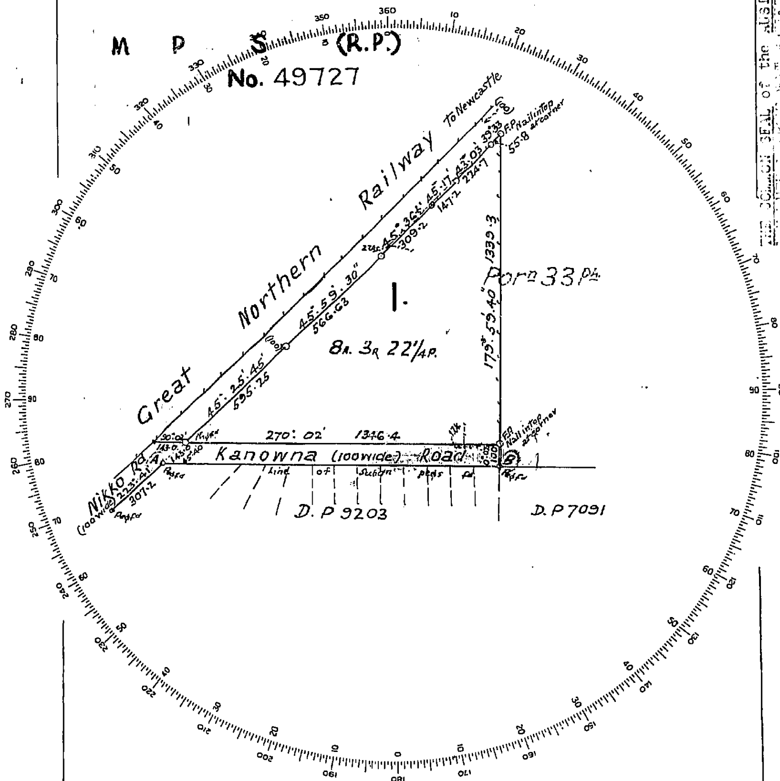
PLAN

of part of Portion 33 Ph.

Parish of Munmorah County of Northumberland

Scale 4 Chains to an Inch

M P S (R.P.) No. 49727



This margin to be left free from notation

The Common Seal of the Australian Mutual Provident Society was hereunto affixed at a duly convened Board Meeting in the presence of: Signatures of parties to be made in this margin.

I Frank Chapman of Hunter St Sydney a Surveyor registered under the Surveyor's Act, 1929, do hereby solemnly and sincerely declare (a) that all boundaries and measurements shown on this plan are correct, (b) that all survey marks found and relevant physical objects on or adjacent to the boundaries are correctly represented, (c) that all physical objects indicated actually exist in the positions shown, (d) that the whole of the material facts in relation to the land are correctly represented, (e) that the survey represented in this plan has been made in accordance with the Survey Practice Regulations, 1933 *(1) by me ~~(2) under my supervision, the character and extent of which was as required by the Survey Practice Regulations, 1933~~, and was completed on † 17th April 1936

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of the Oaths Act, 1900.

Approved and covered by Council Clerks Certificate No. 1029 of 18th May 1936

Council Clerk.

Subscribed and declared before me at Sydney this 5th day of May A.D. 1936

Datum line of Azimuth A.B.

(Signature) Frank Chapman

Surveyor registered under the Surveyors Act, 1929

Dates of survey. Novr 1913 & April 1936

*Strike out either (1) or (2). †Insert date of Survey.

1075/9 ... 9.3.45.

This is the plan marked "A" referred to in Memorandum of Transfer Dated 14th February 1944 from Australian Mutual Provident Society to A. ... Compton

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 349727

LINKS	METRES
1	0.201
10	2.012
55.8	11.225
100	20.117
143	28.767
147.2	29.612
224.7	45.202
307.2	61.799
309.2	62.201
566.63	113.988
595.25	119.745
1339.3	269.424
1346.4	270.853

AC RD P	HA
8 3 22 1/4	3.597

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 28th day of July, 1978

Table of mm: 10 20 30 40 50 60 70 80 90 100 110 120 130 140

1

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
20/6/2017 2:20PM

FOLIO: 1/349727

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 5493 FOL 166

Recorded	Number	Type of Instrument	C.T. Issue
2/9/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
20/10/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
16/9/1993		AMENDMENT: LOCAL GOVT AREA	
23/2/1994	U51688	MORTGAGE	EDITION 1
11/11/1994	U780088	DISCHARGE OF MORTGAGE	
11/11/1994	U780089	DISCHARGE OF MORTGAGE	
11/11/1994	U780090	MORTGAGE	EDITION 2
8/11/1999	6322850	DISCHARGE OF MORTGAGE	EDITION 3
30/8/2003	9922031	MORTGAGE	EDITION 4
15/4/2008	AD889532	DISCHARGE OF MORTGAGE	
15/4/2008	AD889533	MORTGAGE	EDITION 5
17/12/2010	AF951604	CAVEAT	
7/3/2011	AG102275	DISCHARGE OF MORTGAGE	EDITION 6
12/10/2012	AH296637	CAVEAT	
9/6/2017	AM465729	CAVEAT	
9/6/2017	AM466673	WITHDRAWAL OF CAVEAT	
9/6/2017	AM466674	WITHDRAWAL OF CAVEAT	

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/349727

SEARCH DATE	TIME	EDITION NO	DATE
20/6/2017	2:18 PM	6	7/3/2011

LAND

LOT 1 IN DEPOSITED PLAN 349727
AT WARNERVALE
LOCAL GOVERNMENT AREA CENTRAL COAST
PARISH OF MUNMORAH COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP349727

FIRST SCHEDULE

GEORGE ALEXANDER WILSON (T H528627)

SECOND SCHEDULE (2 NOTIFICATIONS)

---

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
* 2 AM465729 CAVEAT BY KINGSTON PROPERTY FUND NO.2 PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

ABN 73 149 644 003
Certificate No:12348
Reference No: NIKKO ROAD:106806

Qualtest Labratory (Nsw) Pty Ltd
8 Ironbark Cl
WARABROOK NSW 2304

SECTION 149(2) AND (5) PLANNING CERTIFICATE

This Planning Certificate is issued on 21 June 2017 in respect to the land described below, pursuant to s.149 of the Environmental Planning and Assessment Act 1979

Fee paid:	$133.00
Receipt No:	11968661
Receipt Date:	21 June 2017

DESCRIPTION OF LAND
COUNTY OF NORTHUMBERLAND

Property Address:	27-61 Nikko Road, WARNERVALE NSW 2259
Property Description:	Lot 1 DP 349727
Property Owner:	Mr G A Wilson

The information contained within this certificate relates to the land.

1 RELEVANT PLANNING INSTRUMENTS AND DEVELOPMENT CONTROL PLANS

1.1 Environmental Planning Instruments which apply to the land

Wyong Local Environmental Plan 2013

State Environmental Planning Policy (Infrastructure) 2007
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
State Environmental Planning Policy No 30 – Intensive Agriculture
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004
State Environmental Planning Policy No 21 – Caravan Parks
State Environmental Planning Policy No 62 – Sustainable Aquaculture
State Environmental Planning Policy (State Significant Precincts) 2005
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
State Environmental Planning Policy No 64 – Advertising and Signage
State Environmental Planning Policy (State and Regional Development) 2011
State Environmental Planning Policy No 44 – Koala Habitat Protection
State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy No 36 – Manufactured Home Estates
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007
State Environmental Planning Policy No 65 – Design Quality of Residential Flat Development
State Environmental Planning Policy No 50 – Canal Estate Development
State Environmental Planning Policy No 55 – Remediation of Land
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

1.2 Proposed Environmental Planning Instruments which will apply to the land and is or has been the subject the subject of community consultation or public exhibition

The land is not subject to any Draft Local Environmental Plans.

Draft Amendment to State Environmental Planning Policy No 64 – Advertising and Signage
Draft Amendment to State Environmental Planning Policy (Infrastructure) 2007
Draft State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017
Draft Amendment to State Environmental Planning Policy No 44 – Koala Habitat Protection

1.3 Development Control Plans

Development Control Plan 2013 applies to this land.

2 ZONING AND LAND USE

a Identity of the Zone

Lot 1 DP 349727

E3 Environmental Management
Lot 1 DP 349727

R2 Low Density Residential

For each of the environmental planning instruments referred to in clause 1, please refer to the attached land use table to determine (b), (c) and (d) listed below:

b development that may be carried out within the zone without the need for development consent,

c development which may not be carried out within the zone except with development consent and

d development which is prohibited within the zone

e Development Standards applying to the land

Development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on this land.

The minimum land dimension so fixed is 450m^2.

Development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on this land.

The minimum land dimension so fixed is 40ha.

f Critical Habitat

Nil

g Conservation Area

Nil

h Environmental Heritage

Nil

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

Not applicable

3 COMPLYING DEVELOPMENT

Whether or not the land is land on which complying development can be carried out under each of the codes for complying development because of the provisions of clause 1.17A (c) and (d) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008?*

1. PART 3 – GENERAL HOUSING CODE

   a Complying Development under the General Housing Code **may** be carried out on the land.

2. PART 3A – RURAL HOUSING CODE

   a Complying development under the Rural Housing Code **may** be carried out on the land providing the land is not less than the minimum lot size for the erection of a dwelling house under the Wyong Local Environmental Plan 2013.

3. PART 4 – HOUSING ALTERATIONS CODE

a Complying development under the Housing Alterations Code **may** be carried out on the land.

4. PART 4A – GENERAL DEVELOPMENT CODE

a Complying development under the General Development Code **may** be carried out on the land.

5. PART 5 – COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

a Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

6. PART 5A – COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

a Complying development under the Commercial and Industrial (New Buildings and Additions) Code **may** be carried out on the land.

7. PART 6 – SUBDIVSIONS CODE

a Complying development under the Subdivisions Code **may** be carried out on the land.

8. PART 7 – DEMOLITION CODE

a Complying development under the Demolition code **may** be carried out on the land.

9. PART 8 – FIRE SAFETY CODE

a Complying development under the Fire Safety Code **may** be carried out on the land.

4 COASTAL PROTECTION ACT 1979

This land is within the coastal zone as defined by the Coastal Protection Act however there are no notices under Sections 38 or 39 of this Act.

4A CERTAIN INFORMATION RELATING TO BEACHES AND COASTS

1. An order has not been made under Part 4D of the *Coastal Protection Act 1979* on this land or on any public land adjacent to this property in relation to temporary coastal protection works. If an order has been made previously, Council is fully

satisfied that the order has been complied with.

2. Council has not been notified under section 55X of the *Coastal Protection Act 1979* that temporary coastal protection works have been placed on the land or public land adjacent to this property.

4B ANNUAL CHARGES UNDER LOCAL GOVERNMENT ACT 1993 FOR COASTAL PROTECTION SERVICES THAT RELATE TO EXISTING COASTAL PROTECTION WORKS

The owner (or any previous owner) of the land has not consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works.

5 MINE SUBSIDENCE

The land is not within a proclaimed Mine Subsidence District.

6 ROAD WIDENING OR ROAD ALIGNMENT

1. DIVISION 2 SECTION 25 OF THE ROADS ACT 1993

   The land is not affected by road realignment or road widening under the above.

2. ENVIRONMENTAL PLANNING INSTRUMENT

   The land is not affected by road widening or road re-alignment under the above.

3. COUNCIL RESOLUTIONS

   The land is not affected by road widening or road re-alignment under the above.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES TO RESTRICT DEVELOPMENT DUE TO RISK

This land is **not** affected by a policy 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).

7A FLOOD RELATED DEVELOPMENT CONTROLS

1. Development on this land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or senior housing) and for other purposes is subject to flood related development controls.

2. Development on this land or part of the land for any other purpose is subject to flood related development controls.

A word or expression used in this clause has the same meaning as it has in the *Floodplain Development Manual* (ISBN 0 7347 5476 0), published by the NSW Government in April 2005, unless it is otherwise defined in this Plan.

8 LAND RESERVED FOR ACQUISITION

The following environmental planning instruments and proposed environmental planning instruments make provisions for the acquisition of land by a public authority as referred to in Section 27 of the Act:

Nil

9 CONTRIBUTION PLANS

The land is subject to Section 94 Contributions Plan – Warnervale District.

This land is subject to the Section 94 Contributions Plan for Wyong Shire No. 11 - Shirewide Infrastructure, Services and Facilities.

This land is subject to the Wyong Shire Section 94A Levy Development Contributions Plan.

9A BIODIVERSITY CERTIFIED LAND

The land **is not** biodiversity certified land within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*.

10 BIOBANKING AGREEMENTS

Council has not been notified by the Director-General of the Department of Planning and Environment of an agreement issued under Part 7A of the *Threatened Species Conservation Act 1995*.

11 BUSHFIRE PRONE LAND

The information currently available to Council indicates **all** of the land is shown as bush fire prone land according to the Act.

12 PROPERTY VEGETATION PLAN

This land is not subject to a property vegetation plan under the Native Vegetation Act 2003.

NOTE: The advice provided in this section is based on notification by the Local Land Services - Greater Sydney of the approval of a plan. Further information about property vegetation plans should be obtained from that Authority.

13 ORDER UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

Council has not been notified of an Order issued under the Trees (Disputes between Neighbours) Act 2006.

NOTE: This advice is based on information provided by the Land and Environment Court.

14 DIRECTIONS UNDER PART 3A

Not Applicable

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR SENIORS HOUSING

Council is not aware of there being a valid Site Compatibility Certificate issued by the Director-General of the Department of Planning and Environment in respect of the land.

NOTE: This advice is based on information provided by the NSW Department of Planning and Environment.

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTUCTURE

Council is not aware of there being a valid Site Compatibility Certificate issued by the Director-General of the Department of Planning and Environment in respect of the land.

NOTE: This advice is based on information provided by the NSW Department of Planning and Environment.

17 SITE COMPATIBILITY CERTIFICATES FOR AFFORDABLE RENTAL HOUSING

Council is not aware of there being a valid Site Compatibility Certificate issued by the Director-General of the Department of Planning and Environment in respect of the land.

NOTE: This advice is based on information provided by the NSW Department of Planning and Environment.

18 PAPER SUBDIVISION INFORMATION

1. THE NAME OF ANY DEVELOPMENT PLAN ADOPTED BY A RELEVANT AUTHORITY THAT APPLIES TO THIS LAND OR THAT IS PROPOSED TO BE SUBJECT TO A CONSENT BALLOT.

   Nil

2. THE DATE OF ANY SUBDIVISION ORDER THAT APPLIES TO THIS LAND.

   Not applicable

Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

19 SITE VERIFICATION CERTIFICATE

Council is not aware of a Site Verification Certificate having been issued by the Director-General of the Department of Planning and Environment in respect to this land.

Note: A site verification certificate sets out the Director-General's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*.

20 LOOSE-FILL ASBESTOS INSULATION

This land does not include any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that are listed on the register that is required to be maintained under that Division. That register lists residential premises that contain or have contained loose-fill asbestos insulation.

21 CONTAMINATED LAND MANAGEMENT ACT 1997

Nil Prescribed Matters

22 ADVICE PROVIDED PURSUANT TO S.149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

22.1 Prescribed Streams

Approval of the NSW Office of Water is required before the removal of any native vegetation within 20 metres of a prescribed stream. Contact the Office of Water for details.

*****

For any enquiries regarding this Certificate please contact Council's Customer Contact Centre on 4350 5555.

Tim Ennis
Signed on Behalf of Council

LAND USE TABLE

Zone E3 Environmental Management

Wyong Local Environmental Plan 2013

1 Objectives of zone

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
- To provide for a limited range of development that does not have an adverse effect on those values.

2 Permitted without consent

Home occupations

3 Permitted with consent

Bed and breakfast accommodation; Building identification signs; Business identification signs; Community facilities; Dual occupancies; Dwelling houses; Eco-tourist facilities; Emergency services facilities; Environmental facilities; Environmental protection works; Extensive agriculture; Farm buildings; Farm stay accommodation; Flood mitigation works; Home-based child care; Home businesses; Home industries; Horticulture; Information and education facilities; Recreation areas; Research stations; Roads; Roadside stalls; Secondary dwellings; Sewage treatment plants; Water recreation structures; Water recycling facilities; Water supply systems

4 Prohibited

Industries; Multi dwelling housing; Residential flat buildings; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3.

LAND USE TABLE

Zone R2 Low Density Residential
Wyong Local Environmental Plan 2013

1 Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To maintain and enhance the residential amenity and character of the surrounding area.
- To provide a residential character commensurate with a low density residential environment.

2 Permitted without consent

Nil

Home occupations

3 Permitted with consent

Bed and breakfast accommodation; Boarding houses; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Health consulting rooms; Home-based child care; Home businesses; Home industries; Information and education facilities; Jetties; Neighbourhood shops; Places of public worship; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Shop top housing; Water recycling facilities; Water reticulation systems; Water storage facilities

4 Prohibited

Any development not specified in item 2 or 3

Contaminated land
+ Management of contaminated land
+ Consultants and site auditor scheme
+ Underground petroleum storage systems
Guidelines under the CLM Act
NEPM amendment
+ Further guidance
– Record of notices
About the record
Search the record
Search tips
Disclaimer
List of NSW contaminated sites notified to EPA
Frequently asked questions
Forms
+ Other contamination issues
+ Contaminated Land Management Program

Home Contaminated land Record of notices

Site and notice details

Your search for: Suburb: WARNERVALE 3 notices on 1 site were matched.
Return to list of search results Search Again Refine Search

Area No: 3139

The information below was correct at the time the notices were issued.

Site: Former Timber Treatment Plant
Address: Aldenham and Railway ROADS, WARNERVALE
LGA: Wyong Shire Council

Owner: Various
Lot 1-3 DP 813908 Lot 34 DP 9215

Notices relating to this site (0 current and 3 former)

(Map) where available, maps show the part of the site affected by the notice
* notice matched search criteria

Notice recipient	Notice type & number	Status	Date
Wyong Shire Council	EHC Act Revocation Notice * 550	Former	Issued 18 Jan 2006
Wyong Shire Council	Section 36 EHC Act Order * 491	Former	Issued 09 Jun 1998 Revoked 18 Jan 2006
Wyong Shire Council	Section 36 EHC Act Order * 477	Former	Issued 20 Feb 1998 Revoked 09 Jun 1998

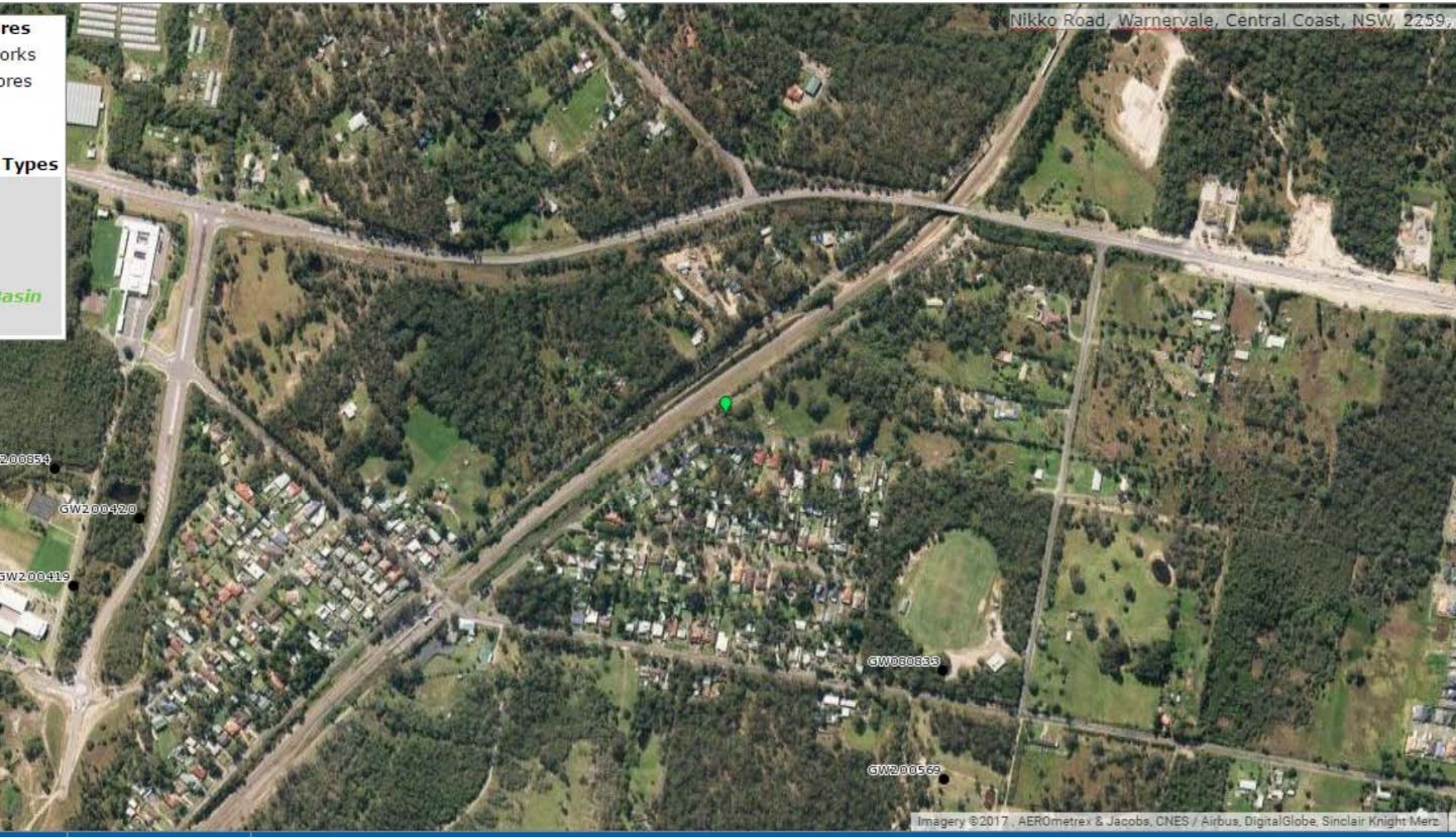
21 June 2017

APPENDIX D:

Groundwater Bore Search

er Map

n Standard Time



NSW Office of Water
Work Summary

GW080833

Licence: 20BL169377 **Licence Status:** CANCELLED

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

Work Type: Bore
Work Status:
Construct.Method:
Owner Type: Local Govt

Commenced Date: **Final Depth:**
Completion Date: 06/08/2004 **Drilled Depth:**

Contractor Name:
Driller:
Assistant Driller:

Property: WARNERVALE OVAL WARNERVALE ROAD WARNERVALE 2259 **Standing Water Level (m):**
GWMA: - **Salinity Description:**
GW Zone: - **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	LT82 DP7091
Licensed:	NORTHUMBERLAND	MUNMORAH	Whole Lot 82//7091

Region: 20 - Hunter **CMA Map:** 9131-1S
River Basin: 211 - MACQUARIE - TUGGERAH LAKES **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6320133.0 **Latitude:** 33°14'53.6"S
Elevation Source: (Unknown) **Easting:** 356274.0 **Longitude:** 151°27'25.9"E

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

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

06/08/2004: Form A Remarks:
Location map received
No Form A received
02/12/2009: Reviewed data - nothing to update.

***** End of GW080833 *****

NSW Office of Water
Work Summary

GW200420

Licence: 20BL168768 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status:
Construct.Method: Hand Auger
Owner Type:

Commenced Date: **Final Depth:** 4.25 m
Completion Date: 20/01/2003 **Drilled Depth:** 4.25 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A CNR SPARKES ROAD & ALBERT WARNER DRIVE WARNERVALE 2259 **Standing Water Level:**
GWMA: - **Salinity:**
GW Zone: - **Yield:**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	2/1047484
Licensed:	NORTHUMBERLAND	MUNMORAH	Whole Lot 1//1047484

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

Elevation: 0.00 m (A.H.D.) **Northing:** 6320343.0 **Latitude:** 33°14'46.2"S
Elevation Source: Unknown **Easting:** 355056.0 **Longitude:** 151°26'38.9"E

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

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.25	0			Hand Auger

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	sand (silty, fine to medium grained, pale grey, fines low liquid limit, root fibres throughout	Sand	

			upper 150mm)		
0.40	0.90	0.50	clay (silty, medium plasticity, pale grey mottled orange-brown)	Clay	
0.90	2.10	1.20	clay (silty, high plasticity, banded grey, orange-brown, red-brown, trace sand fine to medium grained)	Clay	
2.10	2.70	0.60	clay (silty, high plasticity, grey and yellow-brown, lenses of clean sand, fine to medium grained orange-brown, througho	Clay	
2.70	3.30	0.60	clay (silty, high plasticity, grey)	Clay	
3.30	4.25	0.95	sand (clayey, fine to coarse grained, grey to pale purple mottled orange-brown, fines medium plasticity)	Sand	

Remarks

***** End of GW200420 *****

NSW Office of Water
Work Summary

GW200569

Licence: 20BL169377 **Licence Status:** CANCELLED

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

Work Type: Bore
Work Status: Abandoned,Plugged
Construct.Method: Rotary - Percussion (Down Hole Hammer)
Owner Type: Local Govt

Commenced Date:
Completion Date: 07/10/2004
Final Depth: 66.00 m
Drilled Depth: 66.00 m

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

Property: WARNERVALE OVAL WARNERVALE ROAD WARNERVALE 2259
GWMA:
GW Zone:
Standing Water Level:
Salinity:
Yield: 1.100

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	82//7091
Licensed:			

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

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6319969.0
Easting: 356279.0
Latitude: 33°14'58.9"S
Longitude: 151°27'25.9"E

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

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	1.00	270			Rotary - Percussion (Down Hole Hammer)
1		Hole	Hole	1.00	66.00	150			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Steel	0.00	1.00	219	206		

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)
24.00	30.00	6.00	Unknown			0.75			4550.00
42.00	48.00	6.00	Unknown			0.25			4200.00
60.00	66.00	6.00	Unknown			0.10			4750.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	clay (white)	Clay	
0.40	9.00	8.60	sandstone	Sandstone	
9.00	30.00	21.00	sand (light grey)	Sand	
30.00	39.00	9.00	shale (red, brown)	Shale	
39.00	61.00	22.00	shale (brown)	Shale	
61.00	64.00	3.00	sandstone (grey)	Sandstone	
64.00	66.00	2.00	shale (dark grey)	Shale	

Remarks

07/10/2004: Form A Remarks:
Bore abandoned, cap used to plug.
08/05/2009: Nat Carling, 8-May-2009: Updated Lat's & Long's using existing Easting & Northing's.

***** End of GW200569 *****

NSW Office of Water
Work Summary

GW200302

Licence: 20BL170639 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status:
Construct.Method: Rotary
Owner Type:

Commenced Date: **Final Depth:** 180.00 m
Completion Date: 14/11/2006 **Drilled Depth:** 180.00 m

Contractor Name: INTERTEC DRILLING SERVICES
Driller: William Crump
Assistant Driller:

Property: N/A 126 SPARKS ROAD WANERVALE 2259 **Standing Water Level:**
GWMA: - **Salinity:**
GW Zone: - **Yield:** 0.350

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	1/1047484
Licensed:	NORTHUMBERLAND	MUNMORAH	Whole Lot 1//1047484

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

Elevation: 0.00 m (A.H.D.) **Northing:** 6320184.0 **Latitude:** 33°14'51.3"S
Elevation Source: Unknown **Easting:** 354830.0 **Longitude:** 151°26'30.1"E

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

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	13.20	204			Rotary Air
1		Hole	Hole	13.20	180.00	158			Rotary - Percussion (Down Hole Hammer)
1	1	Casing	Pvc Class 9	-0.40	53.60	140			Suspended in Clamps, Screwed and Glued
1	1	Casing	Steel	-0.40	13.10	168	158		Driven into Hole, Welded

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)
51.50	51.70	0.20	Unknown			0.35	54.00		7750.00

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.75	0.75	fill	Fill	
0.75	5.00	4.25	clay (brown)	Clay	
5.00	12.80	7.80	clay (with sandy brown clay bands)	Clay	
12.80	15.00	2.20	sandstone (grey)	Sandstone	
15.00	26.00	11.00	siltstone (blue grey)	Siltstone	
26.00	37.00	11.00	sandstone (blue grey)	Sandstone	
37.00	38.00	1.00	siltstone (grey + red)	Siltstone	
38.00	47.00	9.00	sandstone (blue grey + glomerate)	Sandstone	
47.00	51.50	4.50	siltstone (grey + red)	Siltstone	
51.50	51.70	0.20	sandstone (fractured)	Sandstone	
51.70	53.00	1.30	sandstone (blue grey)	Sandstone	
53.00	55.00	2.00	siltstone (red)	Siltstone	
55.00	62.00	7.00	sandstone (blue grey)	Sandstone	
62.00	118.00	56.00	siltstone (blue grey with sandstone blue grey bands)	Siltstone	
118.00	121.00	3.00	conglomerate (sandstone)	Conglomerate	
121.00	180.00	59.00	siltstone (blue grey with sandstone blue grey bands)	Siltstone	

Remarks

05/11/2009: Updated coordinates as per existing Eastings and Northings.

***** End of GW200302 *****

NSW Office of Water
Work Summary

GW200418

Licence: 20BL168768 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status:
Construct.Method: Hand Auger
Owner Type:

Commenced Date: **Final Depth:** 4.45 m
Completion Date: 20/01/2003 **Drilled Depth:** 4.45 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A CNR SPARKES ROAD & ALBERT WARNER DRIVE WARNERVALE 2259 **Standing Water Level:**
GWMA: - **Salinity:**
GW Zone: - **Yield:**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	2/1047484
Licensed:	NORTHUMBERLAND	MUNMORAH	Whole Lot 1//1047484

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

Elevation: 0.00 m (A.H.D.) **Northing:** 6320120.0 **Latitude:** 33°14'53.3"S
Elevation Source: Unknown **Easting:** 354740.0 **Longitude:** 151°26'26.6"E

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

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.45	0			Hand Auger

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	clay (medium plasticity, pale grey, some sand fine to medium grained)	Clay	

0.50	1.30	0.80	clay (medium plasticity, grey motled orange-brown, some sand fine to medium grained, content increasing in depth)	Clay	
1.30	2.30	1.00	clay (sandy, medium to high plasticity, grey mottled orange-brown, sand fine to medium grained)	Clay	
2.30	2.90	0.60	clay (sandy, medium plasticity, grey mottled orange-brown, sand fine to medium grained)	Clay	
2.90	3.70	0.80	clay (silty sandy, medium to high plasticity, grey mottled yellow-brown, sand fine to medium grained)	Clay	
3.70	4.45	0.75	clay (sandy, medium plasticity, pale grey to pale purple, sand fine to coarse grained)	Clay	

Remarks

***** End of GW200418 *****

NSW Office of Water
Work Summary

GW200419

Licence: 20BL168768 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status:
Construct.Method: Hand Auger
Owner Type:

Commenced Date: **Final Depth:** 4.20 m
Completion Date: 20/01/2003 **Drilled Depth:** 4.20 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A CNR SPARKES ROAD & ALBERT WARNER DRIVE WARNERVALE 2259 **Standing Water Level:**
GWMA: - **Salinity:**
GW Zone: - **Yield:**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	1/1047484
Licensed:	NORTHUMBERLAND	MUNMORAH	Whole Lot 1//1047484

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

Elevation: 0.00 m (A.H.D.) **Northing:** 6320242.0 **Latitude:** 33°14'49.4"S
Elevation Source: Unknown **Easting:** 354958.0 **Longitude:** 151°26'35.1"E

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

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	4.20	0			Hand Auger

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)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	sand (silty, fine to medium grained, pale grey, fines low liquid limit, root fibres throughout	Sand	

			upper 150mm)		
0.30	0.90	0.60	clay (silty sandy, medium plasticity, pale grey mottled orange-brown, sand fine to medium grained)	Clay	
0.90	1.90	1.00	clay (silty, high plasticity, banded grey, orange-brown, red-brown)	Clay	
1.90	2.40	0.50	clay (sandy, high plasticity, grey mottled yellow-brown, sand fine to medium grained)	Clay	
2.40	2.90	0.50	clay (silty sandy, high plasticity, grey and yellow-brown, sand fine to medium grained)	Clay	
2.90	3.50	0.60	clay (sandy, medium plasticity, grey and yellow-brown, sand fine to coarse grained)	Clay	
3.50	4.20	0.70	sand (clayey, fine to coarse grained, pale grey to pale purple, fines medium plasticity)	Sand	

Remarks

***** End of GW200419 *****

NSW Office of Water
Work Summary

GW200854

Licence: 20BL172371 **Licence Status:** ACTIVE

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

Work Type: Bore
Work Status: Equipped
Construct.Method: Sand Pump
Owner Type: School

Commenced Date:
Completion Date: 12/08/2009
Final Depth: 2.90 m
Drilled Depth: 2.90 m

Contractor Name:
Driller: Unkown Unknown
Assistant Driller:

Property: NA CNR SPARKS & ALBERT WARNER RDS WARNERVALE 2259
GWMA:
GW Zone:
Standing Water Level: 2.300
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	NORTH	NORTH.42	12//1149487
Licensed:			

Region: 20 - Hunter
River Basin: 211 - MACQUARIE - TUGGERAH LAKES
Area/District:
CMA Map: 9131-1S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6320417.0
Easting: 354927.0
Latitude: 33°14'43.7"S
Longitude: 151°26'34.0"E

GS Map: -
MGA Zone: 0
Coordinate Source: GPS - Global Positioning System

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	2.90	0			(Unknown)
1		Annulus	Bentonite/Grout	0.00	0.40				PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	0.40	2.90				Graded, PL:Poured/Shovelled
1	1	Casing	Pvc Class 18	0.00	1.40	75	65		Seated on Bottom, Screwed
1	1	Opening	Slots - Horizontal	1.40	2.90	75		1	Casing - Hand Sawn Slot, PVC Class 18, Screwed

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)
2.30	2.90	0.60	Unknown	2.30					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.40	0.40	Topsoil	Topsoil	
0.40	2.90	2.50	Clay, residual	Clay	

Remarks

12/08/2009: Form A Remarks:
Nat Carling, GPS provided by consultant.

***** End of GW200854 *****

APPENDIX E:

Site Photographs

Photograph 1 - Central-northern portion of the site, densely vegetated, looking towards the north

Photograph 2 - Southern portion of the site, looking towards the east

Client:	KINGSTON PROPERTY FUND NO. 2 PTY LTD	Photo No:	1 to 2
Project:	PROPOSED SUBDIVISION	Project No:	NEW17P-0106
Location:	27-61 NIKKO ROAD, WARNERVALE NSW	Date Taken:	28/06/2017
Title:	SITE PHOTOGRAPHS	Date Compiled:	18/07/2017

Photograph 3 - Illegally dumped waste on western boundary, showing MDF board

Photograph 4 - Shed in southern portion of site

Client:	KINGSTON PROPERTY FUND NO. 2 PTY LTD	Photo No:	3 to 4
Project:	PROPOSED SUBDIVISION	Project No:	NEW17P-0106
Location:	27-61 NIKKO ROAD, WARNERVALE NSW	Date Taken:	28/06/2017
Title:	SITE PHOTOGRAPHS	Date Compiled:	18/07/2017

Photograph 5 - Waste materials near shed on southern portion of site

Photograph 6 - Dam in south-east portion of site, showing steep batter slope on eastern side

Client:	KINGSTON PROPERTY FUND NO. 2 PTY LTD	Photo No:	5 to 6
Project:	PROPOSED SUBDIVISION	Project No:	NEW17P-0106
Location:	27-61 NIKKO ROAD, WARNERVALE NSW	Date Taken:	28/06/2017
Title:	SITE PHOTOGRAPHS	Date Compiled:	18/07/2017

APPENDIX F:

Test Pit Logs

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP01

CLIENT: KINGSTON PROPERTY FUND
PAGE: 1 OF 1

PROJECT: PRELIMINARY CONTAMINATION ASSESSMENT
JOB NO: NEW17P-0106

LOCATION: 27-61 NIKKO ROAD, WARNERVALE NSW
LOGGED BY: SR

DATE: 5/7/17

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.5 m
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
E	Not Observed	E 0.10m				SC	TOPSOIL: Clayey SAND - Fine to medium grained, brown to dark brown, root affected.	M				TOPSOIL
							0.15m					
		0.40m				CI-CH	Sandy CLAY - Medium to high plasticity, light brown/ orange brown, with fine grained extremely weathered sandstone gravel.	D to M	St to VSt			RESIDUAL SOIL
		E 0.50m		0.5								
							0.55m					
							Hole Terminated at 0.55 m Due to refusal on extremely weathered rock.					
				1.0								

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

ENGINEERING LOG - TEST PIT

CLIENT: KINGSTON PROPERTY FUND
PROJECT: PRELIMINARY CONTAMINATION ASSESSMENT
LOCATION: 27-61 NIKKO ROAD, WARNERVALE NSW

TEST PIT NO: TP02
PAGE: 1 OF 1
JOB NO: NEW17P-0106
LOGGED BY: SR
DATE: 5/7/17

EQUIPMENT TYPE: 5T EXCAVATOR
TEST PIT LENGTH: 2.0 m **WIDTH:** 0.5 m
SURFACE RL:
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
E	Not Observed	E 0.10m				SC	TOPSOIL: Clayey SAND - Fine to medium grained, brown to dark brown, root affected. Possible asbestos fragment observed on surface.	M				TOPSOIL
							0.15m					
		0.40m					Sandy CLAY - Medium to high plasticity, light brown/ orange brown, with fine grained extremely weathered sandstone gravel.					RESIDUAL SOIL
		E 0.50m		0.5		CI-CH		D to M	St to VSt			
							0.90m					
				1.0			Hole Terminated at 0.90 m Due to refusal on extremely weathered rock.					

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP03

CLIENT: KINGSTON PROPERTY FUND
PAGE: 1 OF 1
PROJECT: PRELIMINARY CONTAMINATION ASSESSMENT
JOB NO: NEW17P-0106
LOCATION: 27-61 NIKKO ROAD, WARNERVALE NSW
LOGGED BY: SR
DATE: 5/7/17

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:
TEST PIT LENGTH: 2.0 m **WIDTH:** 0.5 m
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
E	Not Observed	E 0.10m				SC	TOPSOIL: Clayey SAND - Fine to medium grained, dark brown, root affected. Metal water pipe present.	D to M				TOPSOIL
							0.15m					
		0.40m				CI-CH	CLAY - Medium to high plasticity, brown/ light brown, with fine grained sand.					RESIDUAL SOIL
		E 0.50m		0.5				D to M	VSt			
							0.70m					
						CI-CH	CLAY - Medium to high plasticity, orange/ red brown, fine grained extremely weathered sandstone gravel.					
				1.0			1.00m					
							Hole Terminated at 1.00 m Due to limit of required investigation					

LEGEND:

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

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

Notes, Samples and Tests

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

Field Tests

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

Consistency

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

Density

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

Moisture Condition

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

ENGINEERING LOG - TEST PIT

TEST PIT NO: TP04

CLIENT: KINGSTON PROPERTY FUND
PAGE: 1 OF 1

PROJECT: PRELIMINARY CONTAMINATION ASSESSMENT
JOB NO: NEW17P-0106

LOCATION: 27-61 NIKKO ROAD, WARNERVALE NSW
LOGGED BY: SR

DATE: 5/7/17

EQUIPMENT TYPE: 5T EXCAVATOR
SURFACE RL:

TEST PIT LENGTH: 2.0 m **WIDTH:** 0.5 m
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
E	Not Observed	E 0.10m				SC	TOPSOIL: Clayey SAND - Fine to medium grained, brown to dark brown, root affected, trace fine to coarse grained gravel.	D to M				TOPSOIL
							0.15m					
							CLAY - Medium to high plasticity, light brown, fine grained sand.					RESIDUAL SOIL
		0.40m										
		E 0.50m		0.5		CI-CH		D to M	St to VSt			
							0.80m					
							Hole Terminated at 0.80 m Due to refusal on extremely weathered rock.					
				1.0								

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 G:

Laboratory Results

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	553090-AID
Project Name	NIKKO RD WARNERVALE
Project ID	NEW17P-0106
Received Date	Jul 05, 2017
Date Reported	Jul 12, 2017

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 AS4964 method is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name NIKKO RD WARNERVALE
Project ID NEW17P-0106
Date Sampled Jul 05, 2017
Report 553090-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP2 0.0-0.1	17-Jl05672	Jul 05, 2017	Approximate Sample 176g Sample consisted of: Dark brown coarse grain soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
TP2 0.0-0.1	17-Jl05685	Jul 05, 2017	Approximate Sample 10g / 65x35x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile and amosite 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 (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 06, 2017	Indefinite

eurofins | mgt

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Melbourne
3-5 Kingston Town Close
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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 # 18217

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

Project Name: NIKKO RD WARNERVALE
Project ID: NEW17P-0106

Order No.:
Report #: 553090
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jul 5, 2017 2:30 PM
Due: Jul 19, 2017
Priority: 10 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Ammonia (as N)	Asbestos Absence /Presence	E.coli	Formaldehyde	Helminth Ova	HOLD	pH (1:5 Aqueous extract)	Phosphate total (as P)	Phosphorus	Thermotolerant Coliforms	Acid Herbicides	Metals M8	Total Nitrogen Set (as N)	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X		X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X															
Brisbane Laboratory - NATA Site # 20794																						
Perth Laboratory - NATA Site # 18217																						
External Laboratory										X												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																	
1	TP1 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05671	X								X			X	X	X	X		
2	TP2 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05672	X	X	X						X	X	X	X	X	X	X		
3	TP3 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05673	X								X			X	X	X	X		X
4	TP4 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05674	X		X		X		X		X	X		X	X		X	X	
5	SS1	Jul 05, 2017		Soil	M17-Jl05675	X								X			X	X		X		
6	SS2	Jul 05, 2017		Soil	M17-Jl05676	X								X			X	X		X		
7	SS3	Jul 05, 2017		Soil	M17-Jl05677	X								X			X	X		X		
8	SS4	Jul 05, 2017		Soil	M17-Jl05678	X		X	X	X				X	X	X	X	X	X	X		X
9	SW1	Jul 05, 2017		Water	M17-Jl05679	X		X					X		X		X	X	X			

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Phone : +61 8 9251 9600
NATA # 1261
Site # 18217

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

Project Name: NIKKO RD WARNERVALE
Project ID: NEW17P-0106

Order No.:
Report #: 553090
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jul 5, 2017 2:30 PM
Due: Jul 19, 2017
Priority: 10 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Ammonia (as N)	Asbestos Absence /Presence	E.coli	Formaldehyde	Helminth Ova	HOLD	pH (1:5 Aqueous extract)	Phosphate total (as P)	Phosphorus	Thermotolerant Coliforms	Acid Herbicides	Metals M8	Total Nitrogen Set (as N)	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X		X	X		X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X															
Brisbane Laboratory - NATA Site # 20794																						
Perth Laboratory - NATA Site # 18217																						
10	QC1	Jul 05, 2017		Soil	M17-Jl05680	X		X						X	X		X	X	X	X		
11	TP1 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05681						X											
12	TP2 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05682						X											
13	TP3 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05683						X											
14	TP4 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05684						X											
15	TP2 0.0-0.1	Jul 05, 2017		Building Materials	M17-Jl05685		X															
Test Counts						10	2	5	1	2	4	1	1	9	5	2	10	10	6	9	1	2

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

Sample 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	Yes

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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Certificate of Analysis

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 1254 & 14271

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 **553090-S**
Project name NIKKO RD WARNERVALE
Project ID NEW17P-0106
Received Date Jul 05, 2017

Client Sample ID			**TP1 0.0-0.1**	**TP2 0.0-0.1**	**TP3 0.0-0.1**	**TP4 0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M17-Jl05671**	**M17-Jl05672**	**M17-Jl05673**	**M17-Jl05674**
Date Sampled			**Jul 05, 2017**	**Jul 05, 2017**	**Jul 05, 2017**	**Jul 05, 2017**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	61	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.2	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			TP1 0.0-0.1	TP2 0.0-0.1	TP3 0.0-0.1	TP4 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M17-Jl05671	M17-Jl05672	M17-Jl05673	M17-Jl05674
Date Sampled			Jul 05, 2017	Jul 05, 2017	Jul 05, 2017	Jul 05, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH*	0.5	mg/kg	-	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	-	-	103	-
p-Terphenyl-d14 (surr.)	1	%	-	-	115	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Toxaphene	1	mg/kg	< 1	< 1	< 1	-
Dibutylchlorendate (surr.)	1	%	91	92	91	-
Tetrachloro-m-xylene (surr.)	1	%	110	98	94	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Coumaphos	2	mg/kg	< 2	< 2	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-

Client Sample ID			TP1 0.0-0.1	TP2 0.0-0.1	TP3 0.0-0.1	TP4 0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M17-Jl05671	M17-Jl05672	M17-Jl05673	M17-Jl05674
Date Sampled			Jul 05, 2017	Jul 05, 2017	Jul 05, 2017	Jul 05, 2017
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Monocrotophos	2	mg/kg	< 2	< 2	< 2	-
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Omethoate	2	mg/kg	< 2	< 2	< 2	-
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Triphenylphosphate (surr.)	1	%	105	108	111	-
Acid Herbicides						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 0.5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	117	-	-
Ammonia (as N)	5	mg/kg	5.0	5.0	< 5	< 5
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	-	-	23
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
pH (1:5 Aqueous extract)	0.1	pH Units	-	-	-	7.1
Total Kjeldahl Nitrogen (as N)	10	mg/kg	2900	3900	2600	1400
Total Nitrogen (as N)	10	mg/kg	2900	3900	2600	1400
Phosphorus	5	mg/kg	670	1100	360	800
% Moisture	1	%	28	27	27	20
Helminth Ova			-	-	-	see attached
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.6	3.4
Cadmium	0.4	mg/kg	< 0.4	0.6	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	7.4	5.5	5.9
Copper	5	mg/kg	< 5	22	64	5.7

Client Sample ID			TP1 0.0-0.1	TP2 0.0-0.1	TP3 0.0-0.1	TP4 0.0-0.1
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M17-JI05671**	**M17-JI05672**	**M17-JI05673**	**M17-JI05674**
Date Sampled			**Jul 05, 2017**	**Jul 05, 2017**	**Jul 05, 2017**	**Jul 05, 2017**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	< 5	87	41	40
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	21	680	300	160
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	4.1
Pathogens						
E.coli	1	MPN/g	-	<10	-	<10
Thermotolerant Coliforms	1	MPN/g	-	[M10]10	-	[M10]52

Client Sample ID			SS1	SS2	SS3	SS4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M17-JI05675**	**M17-JI05676**	**M17-JI05677**	**M17-JI05678**
Date Sampled			**Jul 05, 2017**	**Jul 05, 2017**	**Jul 05, 2017**	**Jul 05, 2017**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	< 20
TRH C15-C28	50	mg/kg	-	-	-	< 50
TRH C29-C36	50	mg/kg	-	-	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	-	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	-	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	< 100
TRH >C34-C40	100	mg/kg	-	-	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			SS1	SS2	SS3	SS4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M17-Jl05675	M17-Jl05676	M17-Jl05677	M17-Jl05678
Date Sampled			Jul 05, 2017	Jul 05, 2017	Jul 05, 2017	Jul 05, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	< 0.5
Total PAH*	0.5	mg/kg	-	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	-	102
p-Terphenyl-d14 (surr.)	1	%	-	-	-	119
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Dibutylchlorendate (surr.)	1	%	-	-	-	105
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	109
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2

Client Sample ID			SS1	SS2	SS3	SS4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M17-Jl05675	M17-Jl05676	M17-Jl05677	M17-Jl05678
Date Sampled			Jul 05, 2017	Jul 05, 2017	Jul 05, 2017	Jul 05, 2017
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	99
Acid Herbicides						
2.4-D	0.5	mg/kg	-	-	-	< 0.5
2.4-DB	0.5	mg/kg	-	-	-	< 0.5
2.4.5-T	0.5	mg/kg	-	-	-	< 0.5
2.4.5-TP	0.5	mg/kg	-	-	-	< 0.5
Actril (loxynil)	0.5	mg/kg	-	-	-	< 0.5
Dicamba	0.5	mg/kg	-	-	-	< 0.5
Dichlorprop	0.5	mg/kg	-	-	-	< 0.5
Dinitro-o-cresol	0.5	mg/kg	-	-	-	< 0.5
Dinoseb	0.5	mg/kg	-	-	-	< 0.5
MCPA	0.5	mg/kg	-	-	-	< 0.5
MCPB	0.5	mg/kg	-	-	-	< 0.5
Mecoprop	0.5	mg/kg	-	-	-	< 0.5
Warfarin (surr.)	1	%	-	-	-	124
Ammonia (as N)	5	mg/kg	< 5	< 5	5.3	< 5
Formaldehyde	10	mg/kg	-	-	-	< 10
Nitrate & Nitrite (as N)	5	mg/kg	< 5	< 5	< 5	< 5
Total Kjeldahl Nitrogen (as N)	10	mg/kg	4100	3400	4600	2600
Total Nitrogen (as N)	10	mg/kg	4100	3400	4600	2600
Phosphorus	5	mg/kg	640	950	5000	790
% Moisture	1	%	24	29	33	27
Helminth Ova			-	-	-	see attached

Client Sample ID			SS1	SS2	SS3	SS4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M17-Jl05675	M17-Jl05676	M17-Jl05677	M17-Jl05678
Date Sampled			Jul 05, 2017	Jul 05, 2017	Jul 05, 2017	Jul 05, 2017
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	< 2	< 2	2.7	4.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	< 5	6.8	9.2
Copper	5	mg/kg	< 5	5.3	13	17
Lead	5	mg/kg	11	9.7	25	47
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1
Nickel	5	mg/kg	< 5	< 5	6.4	< 5
Zinc	5	mg/kg	51	160	810	120
Pathogens						
E.coli	1	MPN/g	-	-	-	<10
Thermotolerant Coliforms	1	MPN/g	-	-	-	M10<10

Client Sample ID			QC1
Sample Matrix			Soil
Eurofins | mgt Sample No.			M17-Jl05680
Date Sampled			Jul 05, 2017
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05
d-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05
Toxaphene	1	mg/kg	< 1
Dibutylchlorendate (surr.)	1	%	107
Tetrachloro-m-xylene (surr.)	1	%	110
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2

Client Sample ID			QC1
Sample Matrix			Soil
Eurofins | mgt Sample No.			M17-Jl05680
Date Sampled			Jul 05, 2017
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	106
Ammonia (as N)	5	mg/kg	< 5
Nitrate & Nitrite (as N)	5	mg/kg	< 5
Total Kjeldahl Nitrogen (as N)	10	mg/kg	2400
Total Nitrogen (as N)	10	mg/kg	2400
Phosphorus	5	mg/kg	330
% Moisture	1	%	25
Heavy Metals			
Arsenic	2	mg/kg	2.1
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	< 5
Copper	5	mg/kg	41
Lead	5	mg/kg	37
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	280
Pathogens			
E.coli	1	MPN/g	<10
Thermotolerant Coliforms	1	MPN/g	[M10]74

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B4			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jul 06, 2017	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Jul 06, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 06, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jul 06, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jul 06, 2017	14 Day
- Method: LTM-ORG-2140 PAH and Phenols in Soils by GCMS			
Eurofins | mgt Suite B14			
Organochlorine Pesticides	Melbourne	Jul 06, 2017	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Jul 06, 2017	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Acid Herbicides	Melbourne	Jul 06, 2017	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
Ammonia (as N)	Melbourne	Jul 06, 2017	7 Day
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Formaldehyde	Melbourne	Jul 06, 2017	7 Day
- Method: Formaldehyde MW AWA			
pH (1:5 Aqueous extract)	Melbourne	Jul 06, 2017	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Phosphorus	Melbourne	Jul 06, 2017	180 Day
- Method: USEPA 6010			
Metals M8	Melbourne	Jul 06, 2017	28 Days
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
E.coli	Melbourne	Jul 06, 2017	72 Hour
- Method: LTM-MIC-6621			
Thermotolerant Coliforms	Melbourne	Jul 06, 2017	72 Hour
- Method: Inhouse: Thermotolerant Coliforms in Soil by MPN*			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Jul 06, 2017	7 Day
- Method: LTM-INO-4030			
Cation Exchange Capacity	Melbourne	Jul 07, 2017	180 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Jul 06, 2017	28 Day
- Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Jul 07, 2017	28 Day
- Method: APHA 4500 TKN			
% Moisture	Melbourne	Jul 06, 2017	14 Day
- Method: LTM-GEN-7080 Moisture			

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

Project Name: NIKKO RD WARNERVALE
Project ID: NEW17P-0106

Order No.:
Report #: 553090
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jul 5, 2017 2:30 PM
Due: Jul 12, 2017
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Ammonia (as N)	Ammonia (as N)	Asbestos Absence /Presence	E.coli	Formaldehyde	Helminth Ova	HOLD	pH (1:5 Aqueous extract)	Phosphorus	Phosphorus	Thermotolerant Coliforms	Acid Herbicides	Metals M8	Metals M8	Total Nitrogen Set (as N)	Total Nitrogen Set (as N)	Eurofins | mgt Suite B14	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X			X	X		X	X	X		X	X	X		X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X	X							X				X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																										
Perth Laboratory - NATA Site # 18217																										
External Laboratory											X															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																					
1	TP1 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05671	X								X				X		X		X		X		
2	TP2 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05672	X		X	X					X		X	X	X		X		X		X		
3	TP3 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05673	X								X				X		X		X		X		X
4	TP4 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05674	X			X		X		X	X		X		X		X				X	X	
5	SS1	Jul 05, 2017		Soil	M17-Jl05675	X								X				X		X				X		
6	SS2	Jul 05, 2017		Soil	M17-Jl05676	X								X				X		X				X		
7	SS3	Jul 05, 2017		Soil	M17-Jl05677	X								X				X		X				X		
8	SS4	Jul 05, 2017		Soil	M17-Jl05678	X			X	X	X			X		X	X	X		X		X		X		X
9	SW1	Jul 05, 2017		Water	M17-Jl05679	X			X					X		X		X		X		X				

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Project Name: NIKKO RD WARNERVALE
Project ID: NEW17P-0106

Order No.:
Report #: 553090
Phone: 02 4968 4468
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Received: Jul 5, 2017 2:30 PM
Due: Jul 12, 2017
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Ammonia (as N)	Ammonia (as N)	Asbestos Absence /Presence	E.coli	Formaldehyde	Helminth Ova	HOLD	pH (1:5 Aqueous extract)	Phosphorus	Phosphorus	Thermotolerant Coliforms	Acid Herbicides	Metals M8	Metals M8	Total Nitrogen Set (as N)	Total Nitrogen Set (as N)	Eurofins | mgt Suite B14	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X			X	X		X	X	X		X	X	X		X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X	X							X				X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																										
Perth Laboratory - NATA Site # 18217																										
10	QC1	Jul 05, 2017		Soil	M17-Jl05680	X			X					X		X		X		X		X		X		
11	TP1 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05681							X														
12	TP2 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05682							X														
13	TP3 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05683							X														
14	TP4 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05684							X														
15	TP2 0.0-0.1	Jul 05, 2017		Building Materials	M17-Jl05685		X	X							X				X		X		X			
Test Counts						11	11	2	5	1	2	4	1	11	11	5	2	11	11	11	11	6	1	9	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Ammonia (as N)	mg/kg	< 5			5	Pass	
Formaldehyde	mg/kg	< 10			10	Pass	
Nitrate & Nitrite (as N)	mg/kg	< 5			5	Pass	
Total Kjeldahl Nitrogen (as N)	mg/kg	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	81			70-130	Pass	
TRH C10-C14	%	78			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	99			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	90			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Xylenes - Total	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	82			70-130	Pass	
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	84			70-130	Pass	
Acenaphthylene	%	96			70-130	Pass	
Anthracene	%	87			70-130	Pass	
Benz(a)anthracene	%	95			70-130	Pass	
Benzo(a)pyrene	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	%	93			70-130	Pass	
Benzo(g.h.i)perylene	%	83			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	87			70-130	Pass	
Dibenz(a.h)anthracene	%	99			70-130	Pass	
Fluoranthene	%	93			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	92			70-130	Pass	
Naphthalene	%	90			70-130	Pass	
Phenanthrene	%	96			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene	%	93			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	118			70-130	Pass	
4.4'-DDE	%	118			70-130	Pass	
4.4'-DDT	%	73			70-130	Pass	
a-BHC	%	118			70-130	Pass	
Aldrin	%	119			70-130	Pass	
b-BHC	%	113			70-130	Pass	
d-BHC	%	125			70-130	Pass	
Dieldrin	%	114			70-130	Pass	
Endosulfan I	%	114			70-130	Pass	
Endosulfan II	%	115			70-130	Pass	
Endosulfan sulphate	%	114			70-130	Pass	
Endrin	%	102			70-130	Pass	
Endrin aldehyde	%	115			70-130	Pass	
Endrin ketone	%	117			70-130	Pass	
g-BHC (Lindane)	%	120			70-130	Pass	
Heptachlor	%	106			70-130	Pass	
Heptachlor epoxide	%	115			70-130	Pass	
Hexachlorobenzene	%	114			70-130	Pass	
Methoxychlor	%	76			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	126			70-130	Pass	
Dimethoate	%	118			70-130	Pass	
Ethion	%	123			70-130	Pass	
Fenitrothion	%	105			70-130	Pass	
Methyl parathion	%	96			70-130	Pass	
Mevinphos	%	89			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	70			70-130	Pass	
2.4-DB	%	80			70-130	Pass	
2.4.5-T	%	77			70-130	Pass	
2.4.5-TP	%	100			70-130	Pass	
Actril (loxynil)	%	90			70-130	Pass	
Dicamba	%	116			70-130	Pass	
Dichlorprop	%	85			70-130	Pass	
Dinitro-o-cresol	%	83			70-130	Pass	
Dinoseb	%	90			70-130	Pass	
MCPA	%	72			70-130	Pass	
MCPB	%	74			70-130	Pass	
Mecoprop	%	95			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	110			70-130	Pass	
Formaldehyde	%	90			70-130	Pass	
Nitrate & Nitrite (as N)	%	104			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	106			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Cadmium	%	101			80-120	Pass	
Chromium	%	105			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	104			80-120	Pass	
Lead			%	108			80-120	Pass	
Mercury			%	106			75-125	Pass	
Nickel			%	104			80-120	Pass	
Zinc			%	103			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M17-Jl03685	NCP	%	122			70-130	Pass	
4.4'-DDE	M17-Jl03685	NCP	%	125			70-130	Pass	
4.4'-DDT	M17-Jl03685	NCP	%	121			70-130	Pass	
a-BHC	M17-Jl03685	NCP	%	123			70-130	Pass	
Aldrin	M17-Jl03685	NCP	%	123			70-130	Pass	
b-BHC	M17-Jl03685	NCP	%	117			70-130	Pass	
d-BHC	M17-Jl03685	NCP	%	120			70-130	Pass	
Dieldrin	M17-Jl03685	NCP	%	118			70-130	Pass	
Endosulfan I	M17-Jl03685	NCP	%	112			70-130	Pass	
Endosulfan II	M17-Jl03685	NCP	%	115			70-130	Pass	
Endosulfan sulphate	M17-Jl03685	NCP	%	117			70-130	Pass	
Endrin	M17-Jl03685	NCP	%	121			70-130	Pass	
Endrin aldehyde	M17-Jl03685	NCP	%	108			70-130	Pass	
Endrin ketone	M17-Jl03685	NCP	%	120			70-130	Pass	
g-BHC (Lindane)	M17-Jl03685	NCP	%	125			70-130	Pass	
Heptachlor	M17-Jl03685	NCP	%	127			70-130	Pass	
Heptachlor epoxide	M17-Jl03685	NCP	%	116			70-130	Pass	
Hexachlorobenzene	M17-Jl03685	NCP	%	124			70-130	Pass	
Methoxychlor	M17-Jl03685	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S17-Jl02478	NCP	%	117			70-130	Pass	
Dimethoate	S17-Jl02478	NCP	%	129			70-130	Pass	
Ethion	S17-Jl02478	NCP	%	121			70-130	Pass	
Fenitrothion	S17-Jl02478	NCP	%	80			70-130	Pass	
Methyl parathion	S17-Jl02478	NCP	%	72			70-130	Pass	
Mevinphos	S17-Jl02478	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	M17-Jn24238	NCP	%	71			70-130	Pass	
Actril (loxynil)	B17-Jl06120	NCP	%	86			70-130	Pass	
Dichlorprop	B17-Jl06120	NCP	%	80			70-130	Pass	
MCPA	M17-Jn24238	NCP	%	int			70-130	Fail	Q08
MCPB	M17-Jn24238	NCP	%	int			70-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Cadmium	M17-Jl05672	CP	%	81			75-125	Pass	
Chromium	M17-Jl05672	CP	%	75			75-125	Pass	
Copper	M17-Jl05672	CP	%	81			75-125	Pass	
Lead	M17-Jl05672	CP	%	120			75-125	Pass	
Mercury	M17-Jl05672	CP	%	73			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M17-Jl06637	NCP	%	114			70-130	Pass	
TRH C10-C14	M17-Jl09169	NCP	%	83			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
BTEX				Result 1					
Benzene	M17-Jl06637	NCP	%	119			70-130	Pass	
Toluene	M17-Jl06637	NCP	%	121			70-130	Pass	
Ethylbenzene	M17-Jl06637	NCP	%	104			70-130	Pass	
m&p-Xylenes	M17-Jl06637	NCP	%	123			70-130	Pass	
o-Xylene	M17-Jl06637	NCP	%	118			70-130	Pass	
Xylenes - Total	M17-Jl06637	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M17-Jl06637	NCP	%	110			70-130	Pass	
TRH C6-C10	M17-Jl06637	NCP	%	118			70-130	Pass	
TRH >C10-C16	M17-Jl09169	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M17-Jl05673	CP	%	92			70-130	Pass	
Acenaphthylene	M17-Jl05673	CP	%	98			70-130	Pass	
Anthracene	M17-Jl05673	CP	%	90			70-130	Pass	
Benz(a)anthracene	M17-Jl05673	CP	%	100			70-130	Pass	
Benzo(a)pyrene	M17-Jl05673	CP	%	98			70-130	Pass	
Benzo(b&j)fluoranthene	M17-Jl05673	CP	%	100			70-130	Pass	
Benzo(g.h.i)perylene	M17-Jl05673	CP	%	87			70-130	Pass	
Benzo(k)fluoranthene	M17-Jl05673	CP	%	90			70-130	Pass	
Chrysene	M17-Jl05673	CP	%	102			70-130	Pass	
Dibenz(a.h)anthracene	M17-Jl05673	CP	%	102			70-130	Pass	
Fluoranthene	M17-Jl05673	CP	%	104			70-130	Pass	
Fluorene	M17-Jl05673	CP	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M17-Jl05673	CP	%	94			70-130	Pass	
Naphthalene	M17-Jl05673	CP	%	94			70-130	Pass	
Phenanthrene	M17-Jl05673	CP	%	103			70-130	Pass	
Pyrene	M17-Jl05673	CP	%	103			70-130	Pass	
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M17-Jl05680	CP	%	97			70-130	Pass	
Nitrate & Nitrite (as N)	M17-Jl05680	CP	%	92			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S17-Jl02473	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Fensulfothion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S17-Jl02473	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S17-Jl02473	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S17-Jl02473	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Phosphorus	M17-Jl05671	CP	mg/kg	670	810	19	30%	Pass	
% Moisture	M17-Jl05446	NCP	%	19	18	4.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M17-Jl05671	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M17-Jl05671	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M17-Jl05671	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	M17-Jl05671	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M17-Jl05671	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	M17-Jl05671	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M17-Jl05671	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	M17-Jl05671	CP	mg/kg	21	21	2.0	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinoseb	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M17-Jl05672	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M17-Jl05672	CP	mg/kg	< 2	2.3	17	30%	Pass	
Cadmium	M17-Jl05672	CP	mg/kg	0.6	0.7	8.0	30%	Pass	
Chromium	M17-Jl05672	CP	mg/kg	7.4	8.7	17	30%	Pass	
Copper	M17-Jl05672	CP	mg/kg	22	26	16	30%	Pass	
Lead	M17-Jl05672	CP	mg/kg	87	99	13	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	M17-Jl05672	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M17-Jl05672	CP	mg/kg	< 5	5.9	17	30%	Pass	
Zinc	M17-Jl05672	CP	mg/kg	680	780	14	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M17-Jl06636	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M17-Jl09178	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M17-Jl09178	NCP	mg/kg	62	53	15	30%	Pass	
TRH C29-C36	M17-Jl09178	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M17-Jl05794	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M17-Jl05794	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M17-Jl05794	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M17-Jl05794	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M17-Jl05794	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M17-Jl05794	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M17-Jl05794	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M17-Jl06636	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M17-Jl09178	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M17-Jl09178	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M17-Jl09178	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S17-Jl02473	NCP	mg/kg	< 0.5	0.7	75	30%	Fail	Q15
Benzo(a)pyrene	S17-Jl02473	NCP	mg/kg	< 0.5	0.8	69	30%	Fail	Q15
Benzo(b&j)fluoranthene	S17-Jl02473	NCP	mg/kg	< 0.5	0.5	40	30%	Fail	Q15
Benzo(g.h.i)perylene	S17-Jl02473	NCP	mg/kg	< 0.5	0.6	37	30%	Fail	Q15
Benzo(k)fluoranthene	S17-Jl02473	NCP	mg/kg	< 0.5	0.7	58	30%	Fail	Q15
Chrysene	S17-Jl02473	NCP	mg/kg	< 0.5	0.7	81	30%	Fail	Q15
Dibenz(a.h)anthracene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S17-Jl02473	NCP	mg/kg	< 0.5	1.5	100	30%	Fail	Q15
Fluorene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S17-Jl02473	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S17-Jl02473	NCP	mg/kg	< 0.5	1.0	150	30%	Fail	Q15
Pyrene	S17-Jl02473	NCP	mg/kg	0.5	1.6	100	30%	Fail	Q15
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M17-Jl05673	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan II	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M17-Jl05673	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M17-Jl05673	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	M17-Jl05148	NCP	uS/cm	640	640	<1	30%	Pass	
pH (1:5 Aqueous extract)	M17-Jl05148	NCP	pH Units	9.3	9.3	pass	30%	Pass	
Total Kjeldahl Nitrogen (as N)	M17-Jl05674	CP	mg/kg	1400	1400	4.9	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M17-Jl05678	CP	mg/kg	< 5	5.1	2.0	30%	Pass	
Formaldehyde	M17-Jl05259	NCP	mg/kg	12	13	13	30%	Pass	
Nitrate & Nitrite (as N)	M17-Jl05678	CP	mg/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
M10	NATA accreditation does not cover the performance of this service in soil matrices
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
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ian Bolch	Senior Analyst-Microbiology (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

eurofins | mgt

Certificate of Analysis

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

NATA Accredited
Accreditation Number 1261
Site Number 1254 & 14271

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 **553090-W**
Project name NIKKO RD WARNERVALE
Project ID NEW17P-0106
Received Date Jul 05, 2017

Client Sample ID			**SW1**
Sample Matrix			**Water**
Eurofins | mgt Sample No.			**M17-Jl05679**
Date Sampled			**Jul 05, 2017**
Test/Reference	LOR	Unit	
Organochlorine Pesticides			
Chlordanes - Total	0.001	mg/L	< 0.001
4.4'-DDD	0.0001	mg/L	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001
Endrin	0.0001	mg/L	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001
Toxaphene	0.01	mg/L	< 0.01
Dibutylchlorendate (surr.)	1	%	55
Tetrachloro-m-xylene (surr.)	1	%	81
Organophosphorus Pesticides			
Azinphos-methyl	0.002	mg/L	< 0.002
Bolstar	0.002	mg/L	< 0.002
Chlorfenvinphos	0.002	mg/L	< 0.002
Chlorpyrifos	0.02	mg/L	< 0.02
Chlorpyrifos-methyl	0.002	mg/L	< 0.002
Coumaphos	0.02	mg/L	< 0.02
Demeton-S	0.02	mg/L	< 0.02
Demeton-O	0.002	mg/L	< 0.002
Diazinon	0.002	mg/L	< 0.002
Dichlorvos	0.002	mg/L	< 0.002
Dimethoate	0.002	mg/L	< 0.002

Client Sample ID			SW1
Sample Matrix			Water
Eurofins | mgt Sample No.			M17-Jl05679
Date Sampled			Jul 05, 2017
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Disulfoton	0.002	mg/L	< 0.002
EPN	0.002	mg/L	< 0.002
Ethion	0.002	mg/L	< 0.002
Ethoprop	0.002	mg/L	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002
Fenitrothion	0.002	mg/L	< 0.002
Fensulfothion	0.002	mg/L	< 0.002
Fenthion	0.002	mg/L	< 0.002
Malathion	0.002	mg/L	< 0.002
Merphos	0.002	mg/L	< 0.002
Methyl parathion	0.002	mg/L	< 0.002
Mevinphos	0.002	mg/L	< 0.002
Monocrotophos	0.002	mg/L	< 0.002
Naled	0.002	mg/L	< 0.002
Omethoate	0.002	mg/L	< 0.002
Phorate	0.002	mg/L	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02
Pyrazophos	0.002	mg/L	< 0.002
Ronnel	0.002	mg/L	< 0.002
Terbufos	0.002	mg/L	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002
Tokuthion	0.002	mg/L	< 0.002
Trichloronate	0.002	mg/L	< 0.002
Triphenylphosphate (surr.)	1	%	120
Ammonia (as N)	0.01	mg/L	0.04
Nitrate & Nitrite (as N)	0.05	mg/L	0.06
Phosphate total (as P)	0.05	mg/L	0.10
Total Kjeldahl Nitrogen (as N)	0.2	mg/L	0.6
Total Nitrogen (as N)	0.2	mg/L	0.7
Heavy Metals			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	0.003
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.002
Zinc	0.005	mg/L	0.056
Pathogens			
E.coli	1	MPN/100mL	2
Thermotolerant Coliforms	1	MPN/100mL	3

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B14			
Organochlorine Pesticides	Melbourne	Jul 08, 2017	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Melbourne	Jul 08, 2017	7 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Ammonia (as N)	Melbourne	Jul 06, 2017	28 Day
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
Phosphate total (as P)	Melbourne	Jul 07, 2017	28 Day
- Method: APHA 4500-P E. Phosphorous			
Metals M8	Melbourne	Jul 06, 2017	28 Days
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
E.coli	Melbourne	Jul 06, 2017	24 Hour
- Method: LTM-MIC-6621			
Thermotolerant Coliforms	Melbourne	Jul 06, 2017	24 Hour
- Method: Inhouse LTM-MIC-6623: Thermotolerant Coliforms by MPN			
Total Nitrogen Set (as N)			
Nitrate & Nitrite (as N)	Melbourne	Jul 06, 2017	28 Day
- Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA			
Total Kjeldahl Nitrogen (as N)	Melbourne	Jul 07, 2017	7 Day
- Method: APHA 4500 TKN			

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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 18217

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

Project Name: NIKKO RD WARNERVALE
Project ID: NEW17P-0106

Order No.:
Report #: 553090
Phone: 02 4968 4468
Fax: 02 4960 9775

Received: Jul 5, 2017 2:30 PM
Due: Jul 12, 2017
Priority: 5 Day
Contact Name: Emma Coleman

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail	Ammonia (as N)	Ammonia (as N)	Asbestos Absence /Presence	E.coli	Formaldehyde	Helminth Ova	HOLD	pH (1:5 Aqueous extract)	Phosphorus	Phosphorus	Thermotolerant Coliforms	Acid Herbicides	Metals M8	Metals M8	Total Nitrogen Set (as N)	Total Nitrogen Set (as N)	Eurofins | mgt Suite B14	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271	X			X	X		X	X	X		X	X	X		X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217		X	X							X				X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																					
Perth Laboratory - NATA Site # 18217																					
External Laboratory						X															

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																	
1	TP1 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05671	X								X				X		X		X		
2	TP2 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05672	X		X	X					X		X	X	X		X		X		
3	TP3 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05673	X								X				X		X		X		X
4	TP4 0.0-0.1	Jul 05, 2017		Soil	M17-Jl05674	X			X		X		X	X		X		X		X			X	X	
5	SS1	Jul 05, 2017		Soil	M17-Jl05675	X								X				X		X				X	
6	SS2	Jul 05, 2017		Soil	M17-Jl05676	X								X				X		X				X	
7	SS3	Jul 05, 2017		Soil	M17-Jl05677	X								X				X		X				X	
8	SS4	Jul 05, 2017		Soil	M17-Jl05678	X			X	X	X			X		X	X	X		X		X		X	X
9	SW1	Jul 05, 2017		Water	M17-Jl05679	X			X					X		X		X		X		X			

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Received: Jul 5, 2017 2:30 PM
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Sample Detail						Ammonia (as N)	Ammonia (as N)	Asbestos Absence /Presence	E.coli	Formaldehyde	Helminth Ova	HOLD	pH (1:5 Aqueous extract)	Phosphorus	Phosphorus	Thermotolerant Coliforms	Acid Herbicides	Metals M8	Metals M8	Total Nitrogen Set (as N)	Total Nitrogen Set (as N)	Eurofins | mgt Suite B14	Eurofins | mgt Suite B14	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B4
Melbourne Laboratory - NATA Site # 1254 & 14271						X			X	X		X	X	X		X	X	X		X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217							X	X							X				X	X	X	X	X	X	X	
Brisbane Laboratory - NATA Site # 20794																										
Perth Laboratory - NATA Site # 18217																										
10	QC1	Jul 05, 2017		Soil	M17-Jl05680	X			X					X		X		X		X		X		X		
11	TP1 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05681							X														
12	TP2 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05682							X														
13	TP3 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05683							X														
14	TP4 0.4-0.5	Jul 05, 2017		Soil	M17-Jl05684							X														
15	TP2 0.0-0.1	Jul 05, 2017		Building Materials	M17-Jl05685		X	X							X				X		X		X			
Test Counts						11	11	2	5	1	2	4	1	11	11	5	2	11	11	11	11	6	1	9	1	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.02			0.02	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.002			0.002	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Phosphate total (as P)	mg/L	< 0.05			0.05	Pass	
Total Kjeldahl Nitrogen (as N)	mg/L	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	103			70-130	Pass	
4.4'-DDE	%	78			70-130	Pass	
4.4'-DDT	%	73			70-130	Pass	
a-BHC	%	80			70-130	Pass	
Aldrin	%	78			70-130	Pass	
b-BHC	%	108			70-130	Pass	
d-BHC	%	77			70-130	Pass	
Dieldrin	%	78			70-130	Pass	
Endosulfan I	%	87			70-130	Pass	
Endosulfan II	%	88			70-130	Pass	
Endosulfan sulphate	%	87			70-130	Pass	
Endrin	%	71			70-130	Pass	
Endrin aldehyde	%	86			70-130	Pass	
Endrin ketone	%	79			70-130	Pass	
g-BHC (Lindane)	%	78			70-130	Pass	
Heptachlor	%	83			70-130	Pass	
Heptachlor epoxide	%	82			70-130	Pass	
Hexachlorobenzene	%	74			70-130	Pass	
Methoxychlor	%	71			70-130	Pass	
LCS - % Recovery							
Ammonia (as N)	%	101			70-130	Pass	
Nitrate & Nitrite (as N)	%	100			70-130	Pass	
Phosphate total (as P)	%	90			70-130	Pass	
Total Kjeldahl Nitrogen (as N)	%	99			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Cadmium	%	99			80-120	Pass	
Chromium	%	99			80-120	Pass	
Copper	%	100			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead			%	103			80-120	Pass	
Mercury			%	103			75-125	Pass	
Nickel			%	100			80-120	Pass	
Zinc			%	100			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Ammonia (as N)	M17-Jl04753	NCP	%	92			70-130	Pass	
Nitrate & Nitrite (as N)	B17-Jl04210	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M17-Jl05679	CP	%	100			75-125	Pass	
Cadmium	M17-Jl05679	CP	%	96			75-125	Pass	
Chromium	M17-Jl05679	CP	%	96			75-125	Pass	
Copper	M17-Jl05679	CP	%	97			75-125	Pass	
Lead	M17-Jl05679	CP	%	100			75-125	Pass	
Mercury	M17-Jl05679	CP	%	103			70-130	Pass	
Nickel	M17-Jl05679	CP	%	96			75-125	Pass	
Zinc	M17-Jl05679	CP	%	90			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	M17-Jl04753	NCP	mg/L	0.28	0.24	19	30%	Pass	
Nitrate & Nitrite (as N)	B17-Jl04210	NCP	mg/L	0.30	0.31	2.0	30%	Pass	
Phosphate total (as P)	M17-Jl06426	NCP	mg/L	0.12	0.11	6.0	30%	Pass	
Total Kjeldahl Nitrogen (as N)	M17-Jl03332	NCP	mg/L	0.3	0.3	7.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M17-Jl05679	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M17-Jl05679	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M17-Jl05679	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M17-Jl05679	CP	mg/L	0.003	0.002	33	30%	Fail	Q15
Lead	M17-Jl05679	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M17-Jl05679	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M17-Jl05679	CP	mg/L	0.002	0.002	5.0	30%	Pass	
Zinc	M17-Jl05679	CP	mg/L	0.056	0.053	5.0	30%	Pass	

Comments

Helminth Ova analysed by: Environmental Pathogens, report reference 180717SVrep

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	Yes

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ian Bolch	Senior Analyst-Microbiology (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

Environmental *pathogens*

Eurofins Environment Testing Australia P/L
PO Box 276
Oakleigh VIC 3166
ph 03 95647055 fax 03 95647190

Final Report – 18/07/17

Two samples were received and analysed for Helminths as requested. For Helminth detection, the sample was dissolved in buffer and a flotation method was used to recover helminth ova. For the detection of helminth ova/eggs (including Taenia sp., & Ascaris sp.) the results are expressed in ova/cysts per volume of sample tested. The samples were processed according to methods WI 500-12, WI 532, WI 550, WI 552-561 inclusive as appropriate. All controls were valid. The results are in the following tables.

RESULTS

Helminths Detected

Sample Identification	Date Sampled	Volume Tested	Laboratory Number	ova (eggs) detected per 10g	
				Taenia ova	Ascaris ova
M17-Jl05674	5/07/17	10g	17-0108	<1	<1
M17-Jl05678	5/07/17	10g	17-0109	<1	<1

Dr. G. S. Grohmann
Principal Consultant

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name :	Qualtest	**Contact Name:**	Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address :	8 Ironbark Close	**Project Manager :**	Emma Coleman	**PROJECT Number :** NEW17P-0106	**Eurofins | mgt quote ID :** 170411QUAL_1
	Warabrook NSW 2304	**Email for results :**	emmacoleman@qualtest.com.au	**PROJECT Name :** Nikko Rd, Warnervale	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Metals 8	B4 - TRH, BTEX, PAH	B14 - OCP, OPP	Phenoxy herbicides	Helminth ova pathogens	Formaldehyde	M3 - Thermotolerant coliforms & E. Coli	Total Nitrogen	Total phosphorous	Ammonia	pH & CEC	Adsorption (please advise)
1	TP1 0.0-0.1	5/07/2017	Soil	✓		✓					✓	✓	✓		
2	TP1 0.4-0.5	5/07/2017	Soil												
3	TP2 0.0-0.1	5/07/2017	Soil	✓		✓	✓			✓	✓	✓	✓		✓
4	TP2 0.4-0.5	5/07/2017	Soil												
5	TP3 0.0-0.1	5/07/2017	Soil	✓	✓	✓					✓	✓	✓		
6	TP3 0.4-0.5	5/07/2017	Soil												
7	TP4 0.0-0.1	5/07/2017	Soil	✓				✓		✓	✓	✓	✓	✓	
8	TP4 0.4-0.5	5/07/2017	Soil												
9	SS1	5/07/2017	Soil	✓							✓	✓	✓		
10	SS2	5/07/2017	Soil	✓							✓	✓	✓		
11	SS3	5/07/2017	Soil	✓							✓	✓	✓		
12	SS4	5/07/2017	Soil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
13	SW1	5/07/2017	Soil	✓		✓				✓	✓	✓	✓		
14	QC1	5/07/2017	Soil	✓		✓				✓	✓	✓	✓		
15	QC2	5/07/2017	Soil	✓									✓		
16															

Send QC2 to ALS

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

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

Containers:

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

Sample comments:
M3 - *Thermotolerant* coliforms and E. Coli

Send QC2 to ALS

Laboratory Staff

Relinquished By:	Emma Coleman
Date & Time::	5/7/17
Signature:	
Received By:	SUE
Date & Time:	5/7/17 2-30pm
Signature:	LW.

Turn around time

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

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

RMAINE 5/7/17

Temperature on arrival:

Report number: 553090

eurofins | mgt

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
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 # 18217

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

Sample Receipt Advice

Company name:	**Qualtest**
Contact name:	Emma Coleman
Project name:	NIKKO RD WARNERVALE
Project ID:	NEW17P-0106
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jul 5, 2017 2:30 PM
Eurofins | mgt reference:	**553090**

Sample information

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

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☑ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Emma Coleman - emmacoleman@qualtest.com.au.

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

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Qualtest
8 Ironbark Close
Warabrook
NSW 2304

Attention:	Emma Coleman
Report	553382-AID
Project Name	NIKKO RD WARNERVALE
Project ID	NEW17P-0106
Received Date	Jul 07, 2017
Date Reported	Jul 14, 2017

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 AS4964 method is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Project Name NIKKO RD WARNERVALE
Project ID NEW17P-0106
Date Sampled Jul 05, 2017
Report 553382-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
TP1 0.0-0.1	17-Jl07902	Jul 05, 2017	Approximate Sample 912g Sample consisted of: Dark brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
TP2 0.0-0.1	17-Jl07903	Jul 05, 2017	Approximate Sample 694g Sample consisted of: Dark brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
SS4	17-Jl07904	Jul 05, 2017	Approximate Sample 677g Sample consisted of: Dark brown fine grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
SS2A	17-Jl07905	Jul 05, 2017	Approximate Sample 907g Sample consisted of: Dark brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jul 07, 2017	Indefinite

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

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
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 # 18217

Company Name:	Qualtest	**Order No.:**		**Received:**	Jul 7, 2017 8:30 AM
Address:	8 Ironbark Close Warabrook NSW 2304	**Report #:**	553382	**Due:**	Jul 14, 2017
		Phone:	02 4968 4468	**Priority:**	5 Day
		Fax:	02 4960 9775	**Contact Name:**	Emma Coleman
Project Name:	NIKKO RD WARNERVALE				
Project ID:	NEW17P-0106				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 18217						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	TP1 0.0-0.1	Jul 05, 2017		Soil	M17-Jl07902	X
2	TP2 0.0-0.1	Jul 05, 2017		Soil	M17-Jl07903	X
3	SS4	Jul 05, 2017		Soil	M17-Jl07904	X
4	SS2A	Jul 05, 2017		Soil	M17-Jl07905	X
Test Counts						4

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

Sample 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
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Uncertainty data is available on request

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☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: EnviroSampleNSW@eurofins.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: EnviroSampleQLD@eurofins.com.au

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

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

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

Contact Name: Emma Coleman
Project Manager : Emma Coleman
Email for results : emmacoleman@qualtest.com.au

Purchase Order :
PROJECT Number : NEW17P-0106
PROJECT Name : Nikko Rd, Warnervale

COC Number :
Eurofins | mgt quote ID : 170411QUAL_1
Data output format:

Special Directions & Comments :

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Asbestos Quantitative (NEPM/WA Guidelines)
1	TP1 0.0-0.1	5/07/2017	Soil	
2	TP2 0.0-0.1	5/07/2017	Soil	
3	SS4	5/07/2017	Soil	
4	SS2A	5/07/2017	Soil	
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Analytes

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

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

Containers:

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

Sample comments:

Laboratory Staff

Relinquished By: Sam Ramsey
Date & Time:: 6/7/17
Signature:

Received By: SUE
Date & Time: 6/7/17 2.30pm
Signature: SW.

Turn around time

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

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

PMAINE 7/7/17 1509

Temperature on arrival: 10-5

Report number: 553382

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Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
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

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Phone : +61 8 9251 9600
NATA # 1261 Site # 18217

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

Sample Receipt Advice

Company name:	**Qualtest**
Contact name:	Emma Coleman
Project name:	NIKKO RD WARNERVALE
Project ID:	NEW17P-0106
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jul 7, 2017 8:30 AM
Eurofins | mgt reference:	**553382**

Sample information

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

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

Andrew Black on Phone : (+61) 2 9900 8490 or by e.mail: AndrewBlack@eurofins.com

Results will be delivered electronically via e.mail to Emma Coleman - emmacoleman@qualtest.com.au.

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1708815**	Page	: 1 of 2
Client	: **QUALTEST LABORATORY(NSW) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: EMMA COLEMAN	Contact	:
Address	: 8 IRONBARK CLOSE WARABROOK NEW SOUTH WALES 4053	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: 02 4968 4468	Telephone	: +61-3-8549 9600
Project	: NEW17P-0106	Date Samples Received	: 06-Jul-2017 13:05
Order number	: ----	Date Analysis Commenced	: 07-Jul-2017
C-O-C number	: ----	Issue Date	: 11-Jul-2017 13:12
Sampler	: ----		
Site	: Nikko Rd, Warnervale		
Quote number	: SYBQ/388/15		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**QC2**	**----**	**----**	**----**	**----**
			Client sampling date / time	05-Jul-2017 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1708815-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1	%	**21.2**	**----**	**----**	**----**	**----**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**----**	**----**	**----**	**----**
Cadmium	7440-43-9	1	mg/kg	<1	**----**	**----**	**----**	**----**
Chromium	7440-47-3	2	mg/kg	**6**	**----**	**----**	**----**	**----**
Copper	7440-50-8	5	mg/kg	**389**	**----**	**----**	**----**	**----**
Lead	7439-92-1	5	mg/kg	**75**	**----**	**----**	**----**	**----**
Nickel	7440-02-0	2	mg/kg	**5**	**----**	**----**	**----**	**----**
Zinc	7440-66-6	5	mg/kg	**274**	**----**	**----**	**----**	**----**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	**----**	**----**	**----**	**----**
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	**----**	**----**	**----**	**----**

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EM1708815**		
Client	: **QUALTEST LABORATORY(NSW) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: EMMA COLEMAN	Contact	:
Address	: 8 IRONBARK CLOSE WARABROOK NEW SOUTH WALES 4053	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: emmacoleman@qualtest.com.au	E-mail	:
Telephone	: 02 4968 4468	Telephone	: +61-3-8549 9600
Facsimile	: 02 4960 9775	Facsimile	: +61-3-8549 9601
Project	: NEW17P-0106	Page	: 1 of 2
Order number	: ----	Quote number	: ES2016QUATES0001 (SYBQ/388/15)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Nikko Rd, Warnervale		
Sampler	:		

Dates

Date Samples Received	: 06-Jul-2017 13:05	Issue Date	: 06-Jul-2017
Client Requested Due Date	: 13-Jul-2017	Scheduled Reporting Date	: **13-Jul-2017**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 8.1°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample(s) received in non-ALS container(s).**
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EK055 (solids) Ammonia as N	SOIL - S-02 8 Metals (incl. Digestion)
EM1708815-001	05-Jul-2017 00:00	QC2	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

EMMA COLEMAN

- *AU Certificate of Analysis - NATA (COA)	Email	emmacoleman@qualtest.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	emmacoleman@qualtest.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	emmacoleman@qualtest.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	emmacoleman@qualtest.com.au
- A4 - AU Tax Invoice (INV)	Email	emmacoleman@qualtest.com.au
- Chain of Custody (CoC) (COC)	Email	emmacoleman@qualtest.com.au
- EDI Format - ENMRG (ENMRG)	Email	emmacoleman@qualtest.com.au
- EDI Format - ESDAT (ESDAT)	Email	emmacoleman@qualtest.com.au

eurofins | mgt

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Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name :	Qualtest	**Contact Name:**	Emma Coleman	**Purchase Order :**	**COC Number :**
Office Address :	8 Ironbark Close	**Project Manager :**	Emma Coleman	**PROJECT Number :** NEW17P-0106	**Eurofins | mgt quote ID :** 170411QUAL_1
	Warabrook NSW 2304	**Email for results :**	emmacoleman@qualtest.com.au	**PROJECT Name :** Nikko Rd, Warnervale	**Data output format:**

Special Directions & Comments :

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	Metals 8	B4 - TRH, BTEX, PAH	B14 - OCP, OPP	Phenoxy herbicides	Helminth ova pathogens	Formaldehyde	M3 - Thermotolerant coliforms & E. Coli	Total Nitrogen	Total phosphorous	Ammonia	pH & CEC	Asbestos (presence/absence)
1	TP1 0.0-0.1	5/07/2017	Soil	✓		✓					✓	✓	✓		
2	TP1 0.4-0.5	5/07/2017	Soil												
3	TP2 0.0-0.1	5/07/2017	Soil	✓		✓	✓			✓	✓	✓	✓		
4	TP2 0.4-0.5	5/07/2017	Soil												
5	TP3 0.0-0.1	5/07/2017	Soil	✓	✓	✓				✓	✓	✓	✓		
6	TP3 0.4-0.5	5/07/2017	Soil												
7	TP4 0.0-0.1	5/07/2017	Soil	✓				✓		✓	✓	✓	✓	✓	
8	TP4 0.4-0.5	5/07/2017	Soil												
9	SS1	5/07/2017	Soil	✓							✓	✓	✓		
10	SS2	5/07/2017	Soil	✓							✓	✓	✓		
11	SS3	5/07/2017	Soil	✓							✓	✓	✓		
12	SS4	5/07/2017	Soil	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
13	SW1	5/07/2017	Soil	✓		✓				✓	✓	✓	✓		
14	QC1	5/07/2017	Soil	✓		✓				✓	✓	✓	✓		
15	QC2	5/07/2017	Soil	✓											
16															

Send QC2 to ALS

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

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

Containers:

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

Sample comments:
M3 - *Thermotolerant* coliforms and E. Coli

Send QC2 to ALS

Environmental Division
Melbourne
Work Order Reference
EM1708815

Telephone : +61-3-8549 9600

Laboratory Staff

Relinquished By:	Emma Coleman
Date & Time::	5/7/17
Signature:	
Received By:	SUE
Date & Time:	5/7/17 2:30pm
Signature:	LW.

Turn around time

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

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Received: 6/7/17 1305
by Baar (ALS)

APPENDIX H:

Data Validation Report

QA/QC DATA VALIDATION REPORT

PRELIMINARY CONTAMINATION ASSESSMENT, 27-61 NIKKPO ROAD, WARNERVALE

Eurofins report: 553090, 553382
ALS report: EM1708815
Job No: NEW17P-0106

1. SAMPLE HANDLING

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

Sampling Handling was:

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

2. PRECISION AND ACCURACY ASSESSMENT

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

Laboratory Precision and Accuracy was:

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

3. FIELD QA/QC

Item	Sample
Number of Samples Analysed	8 soil, 1 material, 1 surface water
Number of Days Sampling	1
Number of Sampling Events	1

Number and Type of QA/QC Samples Collected

Item	Soil
Field Duplicates (at least one in 20 samples)	2
Trip Blanks (at least one per day or one per sampling event)	0
Wash Blanks (at least one per day, per matrix, or equipment)	0
Other (Trip blank and Trip Spike etc)	0
Were the reporting limits satisfactory?	Yes

Field Duplicates

Item	Yes/No	Comments
Were an adequate number of field duplicates collected?	Yes	
Were RPDs within control limits? No Limit for <10 x EQL and 30% for >10 x EQL	Yes	One RPD for copper was recorded above the acceptance limit for duplicate pair TP03 0.0-0.1/ QC2. The RPD exceedance is likely attributed to the distribution of copper within the topsoil material, which was located adjacent to a metal clad shed. Based on the other metals, and the duplicate sample, showing RPDs below 30%, this RPD is not considered to affect the usability of the results. The higher copper concentration was adopted for the assessment. It is noted that low analytes concentrations exaggerate the percentage differences with respect to small total concentration differences, therefore where results for the primary and duplicate were less than 10 times the LOR, the RPDs have been disregarded.

Trip Blanks/Trip Spikes

Item	Yes/No	Comments
Were an adequate number of trip blanks and trip spikes collected?	No	No trip spikes or blanks were collected. As volatiles were not a primary contaminant of concern this 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 100% and 120%)	N/A	

Rinsate Samples

Item	Yes/No	Comments
Were an adequate number of rinsate samples used? (1 per day of using reusable sampling equipment – trowel, hand auger etc)	No	No rinsate samples were collected. No re-useable sampling equipment was used, and therefore no rinsate samples were required.
Were the rinsate samples free of contaminants? (If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals).	N/A	

Field QC was:

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

4. LABORATORY INTERNAL QUALITY CONTROL PROCEDURES

A) Type of QA/QC Sample	Yes/No	Comments
Laboratory Blanks/Reagent Blanks (at least 1 per batch)	Yes	
Laboratory Duplicates (at least 1 per batch or 1 per 10 samples)	Yes	
Matrix Spikes, Matrix Spike Duplicates (1 for each 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 laboratory control limits?	No	Spike recoveries for MCPA and MCPB (herbicides) were outside of the control limits. Lab code Q08 was quoted: *"The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix Interference."* Based on this, the spike recovery is not considered to affect the usability of the results.
D) Were the RPDs of the laboratory duplicates within control limits?	No	RPDs for numerous PAH compounds for one duplicate pair were outside the lab's acceptable limit. Laboratory code Q15 was quoted: *'The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report'*. Based on this the RPD outliers for the PAH compounds is not considered to affect the usability of the results
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	