JBS&G 54393-114366
L01 Due Diligence - 55 Coonara Road (Rev 0)

2 May 2018

Norm Chow
Mirvac Projects Pty Ltd
Via email: norm.chow@mirvac.com

'Commercial in Confidence'
Contaminated Land Investigation – 55 Coonara Avenue, West Pennant Hills, NSW

Dear Norm,

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Mirvac Projects Pty Ltd (Mirvac, the client) to provide contaminated land consulting services associated with the property located at 55 Coonara Avenue, West Pennant Hills, NSW (the site). The property is legally identified as Lot 61 in Deposited Plan (DP) 737386 and occupies a total area of approximately 26 hectares (ha) as shown in **Figure 1** and **2**.

The site is an irregular shaped parcel of land comprising predominantly undeveloped natural bushland areas, a commercial complex with associated car parking facilities and recreational open space. It is understood the site has historically been used for agricultural purposes (potential market gardens, orchards) and more recently for commercial land uses. The site comprises a campus style precinct, housing IBM with several circa 1980s style buildings, associated car parking and bushland. An ephemeral drainage line and two dams are present within the eastern site extent. Land to the east and south comprises part of the Cumberland State Forest.

It is understood that Mirvac are considering redeveloping the site for mixed land use including residential (apartments buildings ranging from 2 storeys to 6 storeys) and recreational/open space land use. Potential remains for basement parking in areas of the site. Mirvac has requested that JBS&G provide a preliminary contaminated land site assessment to inform cost planning with respect to the proposed development.

This report details the findings of the preliminary investigation undertaken by JBS&G. This report has been developed in accordance with guidelines made or approved by the NSW Environment Protection Authority (EPA). The investigation presented herein has been undertaken in accordance with the requirements for a Preliminary Site Investigation (PSI) pursuant to *State Environmental Planning Policy 55 (SEPP55) – Managing Land Contamination*.

1.2 Objective

The objective of the investigation was to characterise potential contamination at the site, and to draw preliminary conclusions regarding the suitability of the site for the proposed use, or make recommendations to enable such conclusions.

1.3 Scope of works

The scope of works undertaken for the assessment included:

- A review of available Site history and background information to identify potential areas of environmental concern (AECs) and associated contaminants of potential concern (COPC), including:
  - Section 149(2&5) certificates obtained for the property;
  - Records of stored Dangerous Goods held by WorkCover;
  - Relevant previous environmental and geotechnical reports made available by the client or identified to be available within the public domain;
  - Historical aerial photographs obtained from the Department of Lands;
  - Publicly available heritage records held by the Department of Planning and Environment and Council, where readily available;
  - Records of environmental incidents, former environmental licences, or contaminated land notices or notifications, as held by the EPA; and
  - Licensed groundwater bores present within a 1.5 km radius of the site available on the online NSW Natural Resources Atlas.
- Review of the environmental setting including a review of topography, geology, hydrogeology and meteorology of the site and surrounding areas;
- A detailed inspection of the site and surrounds to confirm the presence of potential AECs;
- Implementation of a limited intrusive site investigation program comprising:
  - Soil sampling at 15 borehole locations (HA01 to HA15);
  - Groundwater sampling from three locations (MW07, MW26 and MW04 all installed by others);
- Comparison of collected data against relevant EPA endorsed criteria in relation to assessment, from a contamination perspective, of land use suitability;
- Complete a preliminary assessment of whether the site is suitable, from a site contamination perspective, for the proposed mixed land uses; and
- Preparation of this letter report outlining the findings.

2. Site Description

2.1 Site Identification

The site details are summarised in **Table 2.1** and showing in **Figure 2**.

Table 2.1 Site Details

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1 Summary Site Details

Lots / DPs	Lot 61 in DP 737386
Address	55 Coonara Avenue, West Pennant Hills, NSW
Local Government Authority	The Hills Shire Council
Approximate MGA Coordinates (MGA 56)	As shown on **Figure 2**
Site Zoning	Business Park (B7), The Hills Local Environmental Plan (LEP), The Hills (2012[1])
Current Use	Business Park
Previous Use	Agricultural (potential)
Proposed Use	Residential and public open space (parkland)
Site Area	Approximately 26 hectares (ha)

2.2 Site Description

The site comprised an irregular parcel of land on the south-eastern side of Coonara Avenue and south-west of Castle Hill Road, NSW. Access to the site is via Coonara Avenue. The site is partitioned in northern and southern portions, with the highest point in the northern portion approximately 30 m above the lowest point within the southern portion. The northern portion of the site is predominately developed with asphalt roads, on-grade car parking facilities and the main office complex with vegetation dispersed between parking bays, around buildings and along the perimeter of the site. The main building complex contains several flat roofed multistorey office buildings. There are five separate commercial buildings, each containing three levels, located on the eastern and southern sides of the main office complex. A concrete hardstand loading dock containing stored waste materials, three large diesel generators, three USTs containing diesel, ventilation exhausts and a recyclables dispensing facility is attached to the western side of the main office complex.

An asphalt road is present around the boundary of the northern portion of the site, with car park bays on either side of the road. The northern portion of the site contains 13 designated carpark areas accessible via the asphalt road. The southern portion maintains an extra car park bay currently used as a storage facility for variable message signs and three shipping containers storing garden maintenance equipment. A separate enclosed carpark with rooftop parking designated for IBM employees runs parallel to the eastern boundary fence and surrounded by a riverbed pebble pathway. A stormwater culvert is connected to a dried gulley that's adjacent to the IBM carpark and beneath a walkway bridge that runs from a north to south direction. The northern corner of the site houses several demountables, a diesel generator and storm water collection reservoir. Two dams reside along the eastern boundary, one north of the enclosed IBM carpark, overgrown with weeds and the second to its south.

The southern portion of the site is predominately dense bushland, with an exposed grassed oval located in the south east of the site. Several hiking tracks consisting of exposed soils were observed through bushland at the site. A tributary of Darling Mills Creek flows from an east to south-western direction across the site, flowing off the site towards the southern boundary line to Darling Mills Creek.

The eastern boundary of the site is bound by the Cumberland State Forest the Plants Plus Cumberland Forest Nursery.

2.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roads are summarised below.

- North – The northern boundary of the site abuts Coonara Avenue which connects to Castle Hill Road further north. Medium density residential housing interspersed with commercial

[1] *'The Hills Local Environmental Plan 2012'*, The Hills Shire Council, 19 May 2017, The Hills LEP (2012);

premises (a restaurant and a veterinary hospital) and infrastructure (above ground water storage reservoir) are located beyond Castle Hill Road;

- East – the eastern boundary of the site is shared with the Cumberland State Forest. The property contains the Cumberland State Forest Information Centre and Forestry Corporation of NSW buildings, however is primarily undeveloped bushland. Low density residential allotments are located beyond;
- South – The site is bound to the south by a parcel of undeveloped bushland, identified as 89-97 Castile Hill Road. Low density residential properties are located beyond; and
- West – The site abuts a residential housing development on the western boundary. Further west, a commercial precinct was observed which contained restaurants and retail outlets.

2.4 Topography

Review of topographic information obtained from the Photomaps tool hosted by Nearmap (2017[2]) and as confirmed during site works undertaken on 23 February 2018 indicates that the site generally slopes from the northeast to the southwest, with local topographical features described below.

The site encompasses a local valley, the low line of which is marked by a local drainage line (**Figure 2**) joining the onsite dam to Darling Mills Creek, located south of the site. The highest point of the site is the northeast corner, situated at approximately 150 m AHD. The landscape falls to the lowest point on the southwest corner at 105 m AHD in the alignment of the drainage line.

Local surrounding topography sloped generally downward toward Darling Mills Creek. The site inspection confirmed that the topography on site appeared largely in agreement with the online tools.

2.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Sydney (DMR 1991[3]) indicates that the site is underlain by Ashfield Shale of the Wianamatta Group and generally comprises black to dark-grey shale and laminite. The Ashfield Shale is underlain by Hawkesbury Sandstone.

Reference to the online ESPADE 2.0 tool hosted by the NSW Office of Environment and Heritage (OEH) (2017[4]) indicates the site is within the Glenorie erosional soil landscape. This soil group typically occurs on undulating to rolling low hills on Wianamatta group shales and is characterised by local relief of 50-80 m and slopes of 5-20 %. The landscape is typically characterised by shallow to moderately deep (<100 cm) red podzolic soils on crests, moderately deep (70-150 cm) red and brown podzolic soils on upper slopes, deep (>200 cm) yellow podzolic soils and Gleyed podzolic soils along drainage lines. Soil limitations include high soil erosion hazards, localised impermeable highly plastic soil and the soil is moderately reactive.

2.6 Hydrology

Two main hydrological pathways exist at the site. In areas of sealed ground and on building footprints, excess water is expected to be captured by onsite stormwater drainage infrastructure and discharged into the local municipal stormwater system. In areas of unsealed ground, given the expected/mapped soil characteristics, infiltration into the local, shallow groundwater table is expected to be limited. It is considered likely that onsite vegetation would contain rainfall and retard its overland flow. During periods of heavy rainfall, excess surface waters are expected to flow

[2] *'Photomaps'*, Nearmap, Accessed 2 November 2017, Nearmap (2017) https://www.nearmap.com.au/
[3] '*Sydney 1:100 000 Geological Series Sheet 9030 (Edition 1)'.* Department of Mineral Resources, 1991 (DMR 1991);
[4] *'ESAPDE 2.0'*, NSW Office of Environment and heritage, Accessed 29 August 2017, OEH (2017);

overland into the onsite surface water bodies, or infiltrate into the shallow groundwater aquifer upon encountering porous alluvium in proximity to the onsite drainage line.

As discussed above, the site contains two primary hydrological features, a dam in the northeast corner and a drainage line adjoining the dam to Darling Mills Creek southwest of the site boundary. The drainage line flows towards Darling Mills Creek. The hydrological features are shown in **Figure 2**.

Darling Mills Creek joins the Parramatta River approximately 6.5 km southwest of the site. Darling Mills Creek and the junction with the Parramatta River are considered to be freshwater environments.

2.7 Hydrogeology

Six groundwater monitoring wells were installed at the site during the investigation period by Parsons Brickerhoff (PB) (logs provided as **Attachment 10**). As part of the investigation, JBS&G completed groundwater sampling of these monitoring well locations, in which the standing water level was measured between 2.39 m below top of casing (btoc) (MW07) (north eastern boundary) and 8.86 m btoc (MW19) (southern central area). Groundwater is assessed by JBS&G to flow in a predominantly southerly direction, following topography towards Darling Mills Creek, located at the southern boundary of the site.

2.8 Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Map for Prospect/Parramatta[5] indicates that the site is located within an area of no known or expected occurrence of acid sulfate soils (ASS).

Review of the geographical and topographical location of the Site has indicated that it is a significant distance away from tidal creeks or estuaries, and it is considered unlikely that ASS would exist at the site.

A Section 149(2&5) planning certificate was obtained for the Site, provided in **Attachment 3**, as discussed in **Section 3.2**. The land was not identified to have been affected by a policy adopted by Council or adopted by any other public authority, notified to Council, that restricts the development of the land because of the likelihood of ASS.

2.9 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Seven Hills[6]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 4.5 ^{o}C in July to 17.0 ^{o}C in January;
- Average maximum temperatures vary from 17.4 ^{o}C in July to 28.4 ^{o}C in January;
- The average annual rainfall is approximately 913.1 mm with rainfall greater than 1 mm occurring on an average of 84.1 days per year; and
- Monthly rainfall varies from 43.2 mm in July to 113.5 mm in February with the wettest periods occurring on average in November to March.

[5] '*Acid Sulfate Soil Risk Map – Prospect/Parramatta, Edition 2'*, 1997 1:25 000 Ref: 91 30N3. NSW DLWC (1997);

[6] http://www.bom.gov.au/climate/averages/tables/cw_067026.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 2 November 2017 and accessed by JBS&G on 2 November 2017;

3. Site History

3.1 Aerial Photographs

Copies of aerial photographs obtained from the Department of Land and Property Information are included in **Attachment 4.** Relevant information from the aerial photograph review is summarised below in **Table 3.1**.

Table 3.1 Summary of Aerial Photograph

Year	Site & Surrounding Area Description
1930	The quality of the aerial photograph precluded a detailed assessment of the site and surrounding area features. The site appeared to be mostly undeveloped rural agricultural/pastoral land with no apparent building structures. The northern portion of the site was predominately cleared farmland consisting of multiple grassed paddocks and a singular paddock with disturbed topsoil. The southern portion contained bushland with a small circular clearing of grass in its centre. Surrounding site area use is primarily for rural/agricultural purposes, with residential dwellings and land clearing to the north and west of the site. Dense trees/bushland are present south of the site and to the east.
1943	The central and eastern portions of the site appear to have undergone extensive clearing and appears to have been used primarily for rural/agricultural purposes. Rows of vegetation/crops/trees are evident in these areas. One small sized structure appears in the centre portion of the site, within the crop field. Two smaller structures appear on the site to the immediate north and west of the crop field. The southern portion of the site is primarily occupied by trees/bushland, and the northern portion of the site appears to have been cleared. The surrounding site area appears to be primarily used for agricultural use. To the immediate north of the site is cleared land, with a few residential properties. To the east of the site appears trees / bushland. Structures are evident beyond the eastern site boundary in the same configuration as the present day. To the south of the site is primarily bushland and trees. To the west of the site is cleared land and some small sized residential properties.
1951	The site layout is approximately the same as the previous (1943) aerial photograph, with significant rural/agricultural land use located in the northern portion of the site and to the south-east, adjacent to the eastern boundary. Agricultural land use appears to be for cultivating plants or crops, with a centralised building surrounded by four paddocks of crops. Multiple buildings are adjacent to the north side of the cultivating crops. There were no significant changes to the surrounding area compared to previous years.
1961	There were no significant changes to the site layout or surrounding area compared to 1951 historical aerial photographs.
1970	There were no significant changes to the site layout compared to 1961 historical aerial photographs. The surrounding areas to the northeast appeared to have been the subject of significant residential redevelopment, with high density residential structures which were complete and/or under construction. Additionally, several new building structures were erected southwest and southeast of the site that appear to be related to continued development of rural farmland.
1986	There was a significant redevelopment of the site. Areas of the site previously utilised for agricultural purposes were now cleared and the site appeared to have been redeveloped. The north portion of the site contained multiple concrete parking lots with two western entrances leading into the site. A complex of seven structures was located within the centre of the site, and a single, rectangular building is located the eastern boundary. The configuration of the site appears to mirror the present day setting of the site. Dense tree/bushland is present as per previous years, with a cleared grassed area situated within the southeast of the site – the site of the present day recreational open space Further residential development can be seen northeast of the site area, expanding upon the high density residential structures seen in 1970 northwest. The main road running northwest appears to have widened and expanded southwest along the western boundary of the site area. Residential density increased southeast of the site area with more houses and fewer tree/bushland density.

Year	Site & Surrounding Area Description
1994	The site appeared the same as the previous (1986) aerial photograph with the only exception being the addition of one water holding body/dam located directly to the south of the easternmost structure, along the eastern boundary of the site. The surrounding site area should significant changes with high density residential allotments erected within the northeastern, northwestern, southwestern and southeastern areas. Tree/bushland density decreased in all areas that saw an increase of residential allotments. A large water tank was introduced to the north of the site and multiple roads were upgraded from dirt to bitumen.
2002	The site remained mostly unchanged, with the exception of an additional carpark located in the southeast portion of the site having been constructed. Housing development continued surrounding the site area, with increased residential development to the east, west and northwest from the site area. A sporting field with adjacent club house and car park was established to the west of the site. Further road expansions are noted directly west of the site, with upgrades mad to the southern roads and eastern roads compared to the previous (1994) aerial photograph.
2009	The site remained mostly unchanged with no noticeable alterations when compared to the previous aerial photograph (2002). The surrounding area saw some minor changes with increased residential density to the south and west of the site. The sporting field underwent significant refurbishment but remained largely unchanged.
2017	The site remained mostly unchanged with no noticeable alterations when compared to the previous (2009) aerial photograph. The surrounding area to the northwest saw multiple new residential allotments with a subsequent decrease in green space. The southeast of the site saw a reduction in tree/bushland density with the inclusion of more residential allotments. The sporting field to the west of the site was split into two separate playing fields with an increase of tree density surrounding the fields.

3.2 EPA Records

Search of the NSW EPA database was undertaken on 11 December 2017 (**Attachment 5**) for the site and immediate surroundings. The search consisted of the:

- NSW EPA Protection of the Environment Act public register of licence, applications and notices (maintained under Section 308 of the *Protection of the Environment Operations Act 1997* (POEO Act));
- NSW EPA contaminated land public register of record of notices (under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act)); and
- NSW contaminated sites notified to the EPA (under Section 60 of the CLM Act).

No prevention, clean-up or prohibition notices and no transfer, variation, suspension, surrender or revocation of an environment protection licence records were identified to have been issued under the POEO Act for the site. However, an environmental protection licence (#6209) and licence variation (#1044129), were issued to the site located at 121-132 Oratava Avenue, West Pennant Hills, approximately 1 km to the south of the site. The licence and variation relate to Hazardous, Industrial or Group A Waste Generation or Storage at a scale of 0 to 10 Tonnes.

No notices have been issued under the CLM Act for the site and immediate surroundings.

The site is not on the list of NSW contaminated sites notified to the EPA. The 7-Eleven Service station approximately 1.5 km to the East of the site is listed on this register with a notation that the information provided to the NSW EPA had indicated that regulation under the CLM Act was not required. No further information pertaining to the nature, extent or severity of the contamination is provided by the EPA website. No other nearby sites were identified on this register.

3.3 Council Section 149 Certificates

A copy of the s.149 Planning Certificates for the site (Lot 61 in DP 737386) was obtained from the Hills Shire Council on 11 December 2017. Relevant details are summarised below and a copy of the s.149 Planning Certificate is included in **Attachment 3.**

Relevant Planning Instruments and Development Control Plans

- The land is subject to the requirements under the Hills Local Environmental Plan (LEP, Hills Shire Council 2012a[7]).
- The land is subject to The Hills Development Control Plan 2012 (Hills Shire Council 2012b[8]).

Zoning of Land Under Relevant LEPs

- The land is currently zoned B7 Business Park under the Hills LEP.
- The land does not comprise any land which is considered to be critical habitat, a conservation area or contain any items of environmental heritage.

Other

- The land is not affected by the Coastal Protection code under *the Coastal Protection Act 197*9;
- The land, or part thereof, is not affected identified as being land affected by any road widening or road alignment under Division 2 of Part 3 of the *Roads Act 1993* or any environmental planning instrument;
- The land, or part thereof, is not proclaimed to be mine subsidence district within the meaning of Section 15 of the *Mine Subsidence Compensation Act 1961*;
- The land, or part thereof, is not identified as being affected by a policy adopted by council or adopted by any other public authority and notified to council that restricts development of the land because of the likelihood of ASS or land contamination;
- The land does not include or comprise critical habitat, is not in a conservation area and there are no items of environmental heritage situated on the land;
- Council's electronic property records do not identify the land to be contaminated, or being contaminated, as having been remediated or being remediated;
- Under the meaning of the CLM Act:
    - the land has not been identified as significantly contaminated land;
    - no management order has been issued for the land;
    - the land is not the subject of an approved voluntary management proposal;
    - the land is not subject to an ongoing maintenance order;
    - the land is not the subject of a site audit statement;
- The land has been identified as bushfire prone land. As such, development of the land or part of the land is subject to bushfire related development controls outlined in the NSW Rural Fire Service Guidelines entitled 'Planning for Bushfire Protection 2006';

[7] '*Hills Local Environmental Plan (LEP) 2012*', Hill Shire Council, 2012, (Hills Shire Council 2012a)
[8] '*The Hills Development Control Plan 2012,* Hills Shire Council, 2012, (Hills Shire Council 2012b)

- Development of land or part of the land for the purposes of dwelling houses, dual occupancies, multi-dwelling housing or residential flat buildings is the subject to flood related development controls as a result of a "current" exposure to a flood hazard risk;
- There are no residential premises on the land that are listed on the register as being impacted with Loose-fill asbestos insulation (LFAI). However, it is noted that there is potential for loose-fill asbestos insulation in residential premises that are not currently listed on the register.

3.4 SafeWork Dangerous Goods Search

The results of the Safework Dangerous Goods Search were not available at the time of reporting.

3.5 Heritage Records

A search of the Australian Heritage Trust database did not reveal any heritage listed items at the site or its immediate surrounds. Heritage information covers Aboriginal as well as European heritage.

A search of the NSW Heritage Inventory did not reveal any heritage listed items at the site or immediate surrounds. Both Australian Heritage Trust and NSW Heritage information are included in **Attachment 6**.

3.6 Historical Land Title Records

No historical land title records for the site area were obtained as part of this assessment.

3.7 NSW Parish Maps and Local History Information

A review of available the Hills Shire Council online historical information did not result in the identification of local historical articles pertaining to the site or immediate surrounds.

Review of the online tool hosted by Historic Photographs Australia (HPA), HPA (2017[9]) did not result in the identification of photographs relevant to the site.

4. Site Investigation

A detailed site investigation was completed by one of JBS&Gs experienced and trained staff on 20 February 2018. A photographic log which cam ne reviewed in conjunction with **Figure 2** is presented in **Attachment 7**.

During the site investigation, three underground storage tanks (USTs) were identified within the loading dock area of the commercial complex. Several large generators and air conditioning cooling towers were also present within this area. The loading dock also maintained the storage and distribution of waste materials from the facility such as electronics, recyclables and general waste.

An area designated as Area 7 in **Figure 2** comprises an overflow carpark shared by the site and Plants Plus Cumberland Forest nursey that encroaches onto the grassed area on the south-eastern boundary. A small area of stored waste materials (inert) were also noted on the eastern boundary fence between Plants Plus Cumberland Forest Nursey and the site, and was observed to contain trailers, wooden logs, pallets, metal scrap, waste disposal, concrete and pebble slabs, plastic and food waste.

A concrete lined retention basin (Item 9 – **Figure 2**) was identified on the south side of the southern asphalt road running in a westerly direction. The basin is constructed primarily from concrete and

[9] Sourced from Historic Photographs Australia, accessed 15 September 2017, http://www.historicphotographs.com.au/searcher.asp?terms=epping&force=1&sitemode=2&country=2&region=1&place=&startYear=0&endYear=0

connected to a concrete storm water culvert that runs beneath the southern asphalt road in a northerly direction.

No other evidence of widespread contamination or significant areas of environmental concern were identified during the site inspection.

4.1 Soil Sampling

Soil samples were collected from (15) boreholes (HA01 to HA15) via hand auguring that were advanced across all accessible areas of the site. Sample locations are shown in **Figure 3**.

4.1.1 Soil Sampling Methodology

Soil sampling locations were advanced utilising a hand auger with a 150 mm diameter auger head. Boreholes were advanced until refusal, with a maximum depth of approximately 0.8 m bgs achieved at HA13. Soil samples were generally collected at surface (0-0.1 m bgs), 0.3 m bgs and 0.5 m bgs to a maximum depth of 0.8 m bgs. During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination were noted on borelogs, provided in **Attachment 8**.

Collected samples were immediately transferred to laboratory supplied sample jars. The sample jars were then transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory. Based upon field observations, selected samples were analysed in accordance with the laboratory schedule presented in **Table 4.2**. JBS&G note that not all soil samples collected were analysed. All samples will remain at the primary laboratory for a period of two months from the date of sampling. This will allow future analysis to be completed in the event that further information is required to characterise site conditions, provided that proposed analytes remain within technical holding times.

Boreholes were backfilled with soil cuttings and surface materials to ground surface level.

Duplicate and Triplicate Sample Preparation

Field soil duplicate and triplicate samples were obtained using the above sampling methods. Where sufficient sample volume was available, each sample was divided laterally into three samples with minimal disturbance and placed in clean glass jars. Each sample was labelled with a primary, duplicate or triplicate sample identification before being placed in the same chilled esky for transport to the laboratory.

4.1.2 Groundwater Sampling Methodology

Groundwater Monitoring Well Installation

Six groundwater monitoring wells were installed by PB during the investigation period. Details of the groundwater monitoring well installation are provided in borelogs provided by DP as provided in **Attachment 2**.

Well Development

Following the installation of the groundwater monitoring wells by PB, each newly installed monitoring well was thoroughly developed by JBS&G to remove fines, settle the filter pack and ensure representative groundwater samples could be collected. Well development was undertaken using a Waterra foot valve and metal bailer on 20th February 2018.

Groundwater Sampling

The groundwater monitoring event was undertaken by JBS&G on 23 February 2018.

The newly installed monitoring wells were allowed to settle for a period of 3 days after installation/development. All monitoring wells at the site were gauged and sampled. The depth to standing water was gauged and an assessment of the presence of light non-aqueous phase liquid (LNAPL)/ dense non-aqueous phase liquid (DNAPL) was made using an interface probe. Prior to sampling, field parameters of pH, conductivity, redox and temperature were collected and samples obtained once the field parameters were recorded within a range of approximately 10%. Groundwater samples were obtained through the use of a low flow peristaltic pump and flow cell.

During the groundwater monitoring event, JBS&G noted that only three of the six boreholes installed by DP at the site contained sufficient groundwater to enable sampling (MW01, MW09, MW17).

Collected groundwater samples were immediately transferred to laboratory supplied sample bottles. The sample containers were then transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples. Samples were analysed at a National Association of Testing Authorities (NATA) accredited laboratory in accordance with **Error! Reference source not found.4.2**.

A record of gauging data, sample observations (including colour, odour, presence of LNAPL, DNAPL, sheens) and sampling method details were recorded on field sheets and are summarised in **Section 7.2.**

Duplicate groundwater samples were collected at a rate of one per 20 primary samples. A trip spike/blank (BTEX only) and rinsate blank (for non-dedicated equipment) was collected.

4.2 Laboratory Analysis

NATA accredited laboratories were used for all laboratory analysis. The primary laboratory used for soil, soil vapour and groundwater analysis was Eurofins|mgt Pty Ltd (Eurofins), whilst the secondary laboratory was Envirolab Services Pty Ltd (Envirolab). In addition, the laboratories were required to meet JBS&G internal QA/QC requirements. Laboratory analysis of samples was conducted in accordance with **Table 4.2**.

Table 4.2 Analytical Schedule

Sample Type	No. of Sample Locations	Analyses (EXC. QA/QC)
Soil	15 hand auger locations	Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) – 15 samples PAH – 15 samples TPH/BTEX – 15 samples OCP/PCB – 15 samples Asbestos (500 mL) – 15 samples TCLP (metals/ PAH) – 4 samples pH/ Electrical Conductivity – 15 samples CEC – 2 samples
Groundwater	3 locations	Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) – 3 samples PAH (low levels) – 3 samples TRH/BTEX – 3 samples VOCs – 3 samples OCP – 3 samples EC, pH, Alkalinity – 3 samples

In addition to the above laboratory analysis, a single duplicate and triplicate, trip blank and spike samples were analysed for QA/QC purposes.

5. Assessment Criteria

As no finalised Master Plan is available for the site, concentrations of compounds in soil were compared against the most conservative NEPC (2013) human health-based investigation and screening levels (HILs and HSLs), as outlined below:

- HIL A – Residential with accessible soils;
- HSL A - Petroleum hydrocarbons (sand);
- HSL A - Asbestos in Soil – Bonded ACM – Residential; and
- HSL – Asbestos in Soil – FA & AF

The laboratory limit of detection has been used as the assessment criteria for contaminants where no criteria exist within NEPC 2013.

For the assessment of groundwater, fresh water guidance values have been adopted given the hydrological setting of the site, as discussed in **Section 2**.

Groundwater analytical data for this assessment has been compared against the following groundwater criteria:

- The ANZECC (2000) criteria for the protection of fresh water ecosystems (95% protection).

6. QA/QC Assessment

The results of the laboratory and JBS&G's QA/QC program has been assessed and it is considered that the analytical data is of an acceptable quality for the purposes of this environmental assessment. QA/QC results are included in **Attachment 9**.

7. Results

7.1 Soil

7.1.1 Field Observations

Field observations and geology encountered at the site during the intrusive investigation are summarised below. Sample locations are shown in **Figure 3**, field logs are provided in **Attachment 8** and a photographic log is presented in **Attachment 7**.

A total of 15 soil sampling locations were advanced across the site. HA01 to HA15 identified fill materials generally comprising a homogeneous silty clayey sand (fine), typically existing from the ground surface (or below hardstand) to beyond the depth of investigation (average depth of 0.6 m bgs). Fill materials across the site typically contained inclusions of gravel, concrete, wood chip and plastic. At HA01, fill material comprised a light brown silty sand with gravel inclusions of concrete, brick, plastic and porcelain. The JBS&G field scientist noted minor organic odours at HA07 0.5-0.6, associated with the presence of organic rich materials.

Inspection of fill materials did not identify any fragments of suspected asbestos containing materials (ACM).

7.1.2 Analytical Results

A summary of the analytical results for soil are provided in **Table A** in **Attachment 2.** Laboratory documentation is provided in **Attachment 11.**

7.1.3 Asbestos

No Asbestos Fines, Fibrous Asbestos (AF/FA) or ACM was detected by the testing laboratory.

7.1.4 Heavy Metals

All heavy metals were reported at concentrations less than the adopted site assessment criteria.

7.1.5 PAHs

Total PAH and B(a)P TEQ values for all analysed samples were reported at concentrations less than the adopted assessment criteria.

7.1.6 TRH/BTEX and VOCs

Concentrations of all TRH, BTEX and VOCs were reported below the adopted site assessment criteria in all soil samples selected for analysis.

7.1.7 OCPs and PCBs

Concentrations of OCP and PCB compounds were reported below the adopted health and ecological assessment criteria for all soil samples selected for analysis.

7.2 Preliminary Waste Classification

Based on the results of the soil analysis, as presented in **Table C**, **Attachment 2**, all fill materials at the site are classified as General Solid Waste (Non-Putrescible) in accordance with the *Waste Classification Guidelines, Part 1: Classifying Waste* (NSW EPA 2014). It should be noted that materials surrounding the USTs are precluded from this preliminary assessment.

To facilitate further planning for the classification of materials at the site, the following materials expected to be generated in the initial stages of site redevelopment are pre-classified as General Solid Waste (Non-Putrescible) (NSW EPA 2014) and may be recycled at a facility lawfully able to accept these materials;

- Green Waste – materials that consist of branches, grass, leaves, plants, loppings, tree trunks, tree stumps and similar materials, and any combination of those materials;
- Building and Demolition Waste – includes materials such as bricks, concrete, paper, plastics, glass, metal and non-treated timber and any combination of those (does not include hazardous building materials); and
- Roadways – includes asphalt and concrete.

It should be noted that the information above should only be utilised in preliminary planning for the site redevelopment. A more detailed assessment of waste will be required during redevelopment activities.

7.3 Groundwater

Stabilised groundwater parameters as measured in the field prior to the collection of groundwater samples are presented in **Table 7.1**.

Table 7.1 Groundwater Parameters

Well ID	DO (mg/L)	EC (µs/cm)	pH	Redox (mV)	Temperature (°C)
MW01	1.02	2342	7.20	106.1	21.5
MW07	4.15	273.5	5.91	145.1	21.7
MW19*	1.92	403.5	6.04	153.1	19.3

*Well was purged dry during sampling due to low recharge rates. As such, groundwater sampling was undertaken utilising a disposable bailer following well recharge.

Based on the water quality parameters above, groundwater is generally considered to be saline to fresh and under generally reducing conditions (Eh <200 mV).

The measured depth to groundwater ranged from between 2.39 m btoc (MW07) and 8.86 m btoc (MW19). No odours or sheens were detected during the completion of the groundwater monitoring event.

7.3.1 Analytical Results

A summary of the laboratory analytical results is presented in **Table B** in **Attachment 2**. Complete laboratory reports and chain of custody documentation are provided in **Attachment 11**. Groundwater exceedances are shown in **Figure 4**.

7.3.1.1 Heavy Metals

Concentrations of heavy metals in groundwater were generally below the adopted site criteria, with the exception of:

- Chromium was reported in excess of the adopted site criteria (0.003 mg/L) at MW01 (0.004 mg/L);
- Copper was reported in excess of the adopted site criteria (0.005 mg/L) at MW01 (0.009 mg/L) and MW07 (0.015 mg/L); and
- Zinc was reported in excess of the adopted site criteria (0.026 mg/L) at MW01 (0.03 mg/L) and MW07 (0.031 mg/L).

7.3.1.2 Petroleum Hydrocarbons

TRH/TPH and BTEX concentrations were reported below the adopted site criteria in all samples.

7.3.1.3 Polycyclic Aromatic Hydrocarbons

PAH concentrations were reported below the adopted site criteria in all samples.

7.3.1.4 Organochlorine Pesticides

OCP concentrations were reported below the adopted site criteria in all samples.

7.3.1.5 Volatile Organic Compounds

VOCs were reported in varying concentrations in all groundwater samples, and included compounds such as:

- Bromodichloromethane;
- Chloroform; and
- Dibromochloromethane.

It is noted by JBS&G that the reported concentrations are below applicable trigger values. Furthermore, the reported VOCs included those that are generally considered to be byproducts of disinfection of drinking water. As the drilling of the boreholes involved the use of water it is considered likely that some of the drilling water was present when the sampling was undertaken.

8. Conclusions and Review of Site Contamination Issues

Based on the available site information/history and analytical data, key findings and potential contamination issues at the site include:

- Potential petroleum hydrocarbon contamination emanating from the three USTs located in the loading dock area of the commercial complex located in the centre of the site;
- Based on the results of the preliminary soil investigation completed across the site, widespread contamination was not identified. Analysed soil samples did not contain compounds in concentrations that pose risks to human health under the most conservative land use (HIL-A);

  - It is noted by JBS&G however, that given the size of the site and the presence of hardstand/site structures across large areas of the site, a significant portion of the site was inaccessible at the time of the investigation. As such, the lack of data in these areas represents a data gap and there is a possibility for potential contamination to exist in these areas;

- Fill materials containing anthropogenic inclusions (timber, terracotta, brick etc) were identified surrounding developed areas of the site, specifically carpark areas, surrounding site structures, and in the recreational open space in the south east of the site. Although no fragments of asbestos containing materials (ACM) were identified in fill materials or identified by the laboratory, given the timing of the site redevelopment (1970s), building materials utilised at the time commonly contained asbestos, and as such, JBS&G consider there may be the potential for some areas of the site may include fragments of ACM incorporated within fill materials;
- In regard to groundwater, the elevated concentrations of copper and zinc in groundwater are considered representative of groundwater hosted within marine-deposited shales and are thus not considered to represent gross heavy metal contamination of groundwater from site based anthropogenic sources;
- Based on a review of surrounding site areas, JBS&G do not consider there to be activities or landuses in proximity to the site that have resulted in the spread of contamination to the site from offsite sources; and
- JBS&G note that although widespread contamination was not identified at the site, given a large portion of the site was inaccessible during the investigation, JBS&G consider further detailed investigation of soil, and potentially groundwater at the site, is likely to be required prior to redevelopment.

Further site assessment/RAP and audit documentation may be required for the site by the relevant planning authority to satisfy requirements of State Environmental Planning Policy (SEPP) 55 during assessment of future development applications.

Should you require clarification, please contact the undersigned on 02 8245 0300 or by email ddenaro@jbsg.com.au.

Yours Sincerely:

Daniel Denaro
Project Manager
JBS&G Australia Pty Ltd

Reviewed by:

Greg Dasey
Principal
JBS&G Australia Pty Ltd

Attachments:

(1) Limitations
(2) Tables and Figures
(3) S149 Certificates
(4) Aerial Photographs
(5) NSW EPA Searches
(6) NSW Heritage Records
(7) Photographic Log
(8) Borelogs (HA01 to HA15)
(9) QA/QC Assessment
(10) PB Groundwater Installation Logs
(11) Laboratory Documentation

Attachment 1 – Limitations

This report has been prepared for use by the client who commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties. The report has been prepared specifically for the client for the purposes of the commission, including use by the Site Auditor acting as an agent of the client in this respect. No warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party.

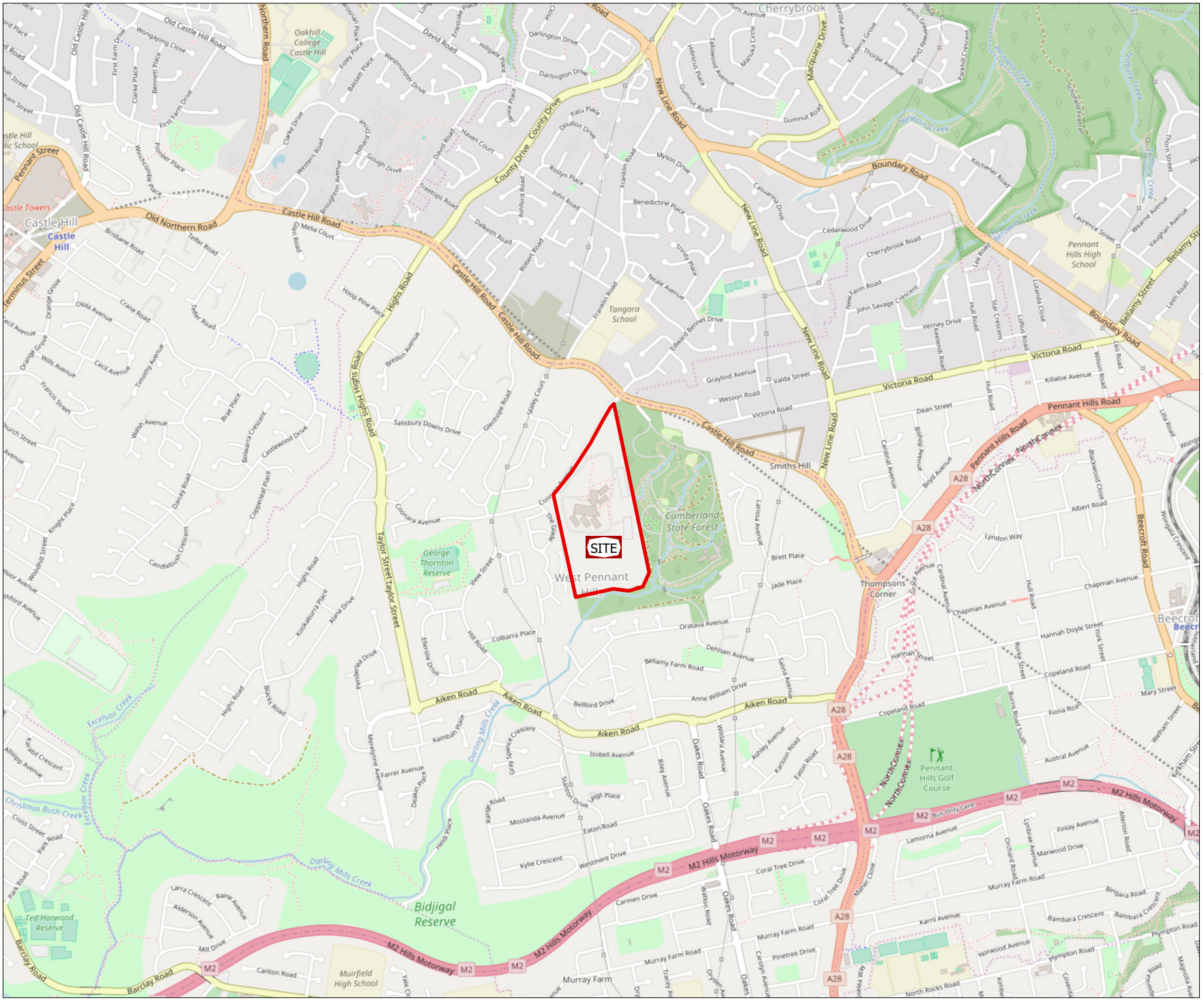
The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be amended in any way without prior approval by JBS&G, or reproduced other than in-full including all attachments as originally provided to the client by JBS&G.

Limited sampling and laboratory analyses were undertaken as part of the investigations reviewed, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the stockpile or subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site or material investigated, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Attachment 2 – Tables and Figures



Legend:
Approximate Site Boundary

JBS&G

Job No: 54393	
Client: Mirvac	
Version: L01 Rev A	Checked By: DD
Date 8/03/2018	Drawn By: AV

Scale 1:25,000

0 300 600
metres

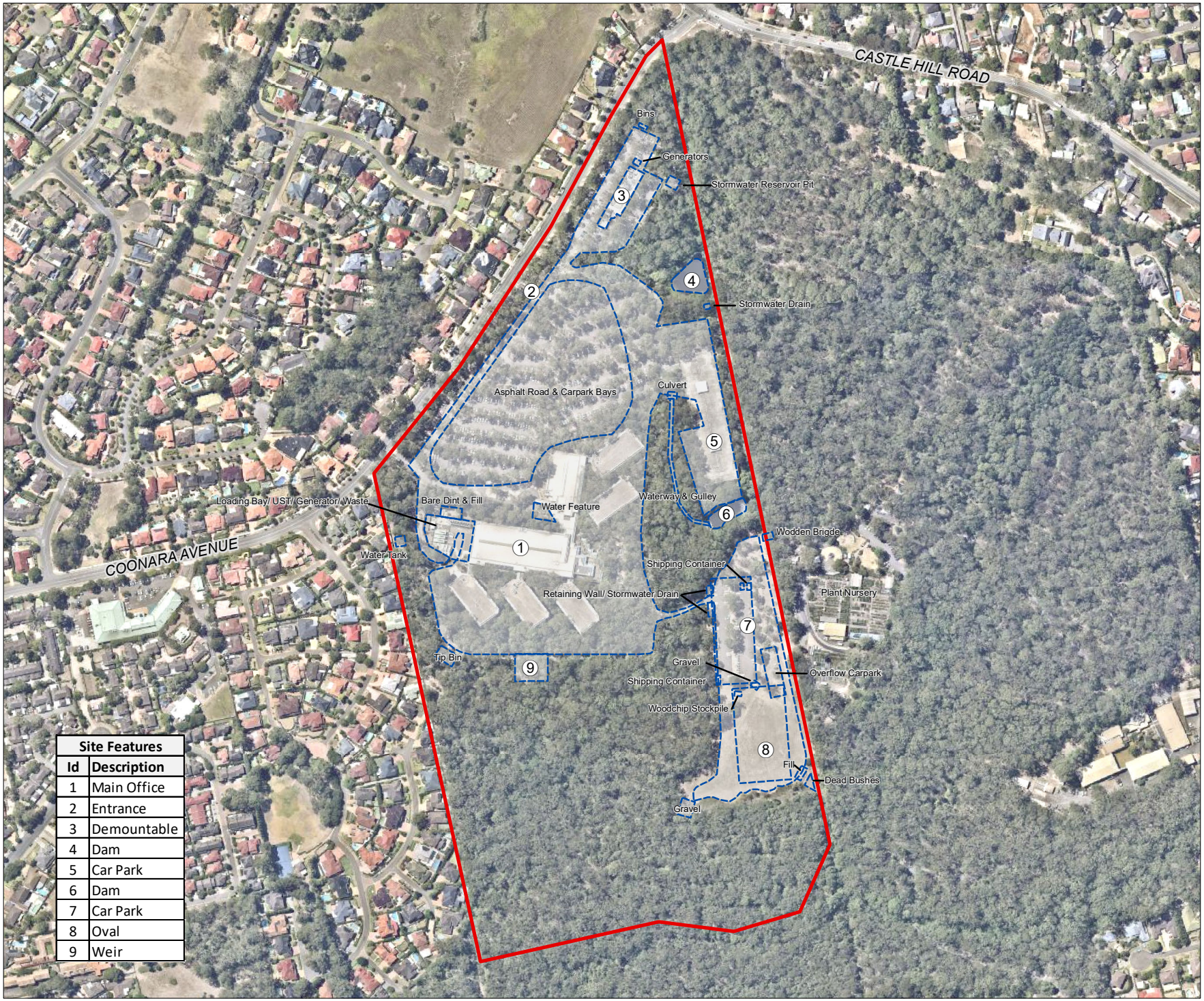
Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

SITE LOCATION

FIGURE: 1

File Name: 54393_01



Site Features	
Id	Description
1	Main Office
2	Entrance
3	Demountable
4	Dam
5	Car Park
6	Dam
7	Car Park
8	Oval
9	Weir

Legend:

Approximate Site Boundary

Development Area

JBS&G

Job No: 54393

Client: Mirvac

Version: L01 Rev 0	Checked By: DD
Date 2/05/2018	Drawn By: AV

Scale 1:5,250

0 60 120

metres

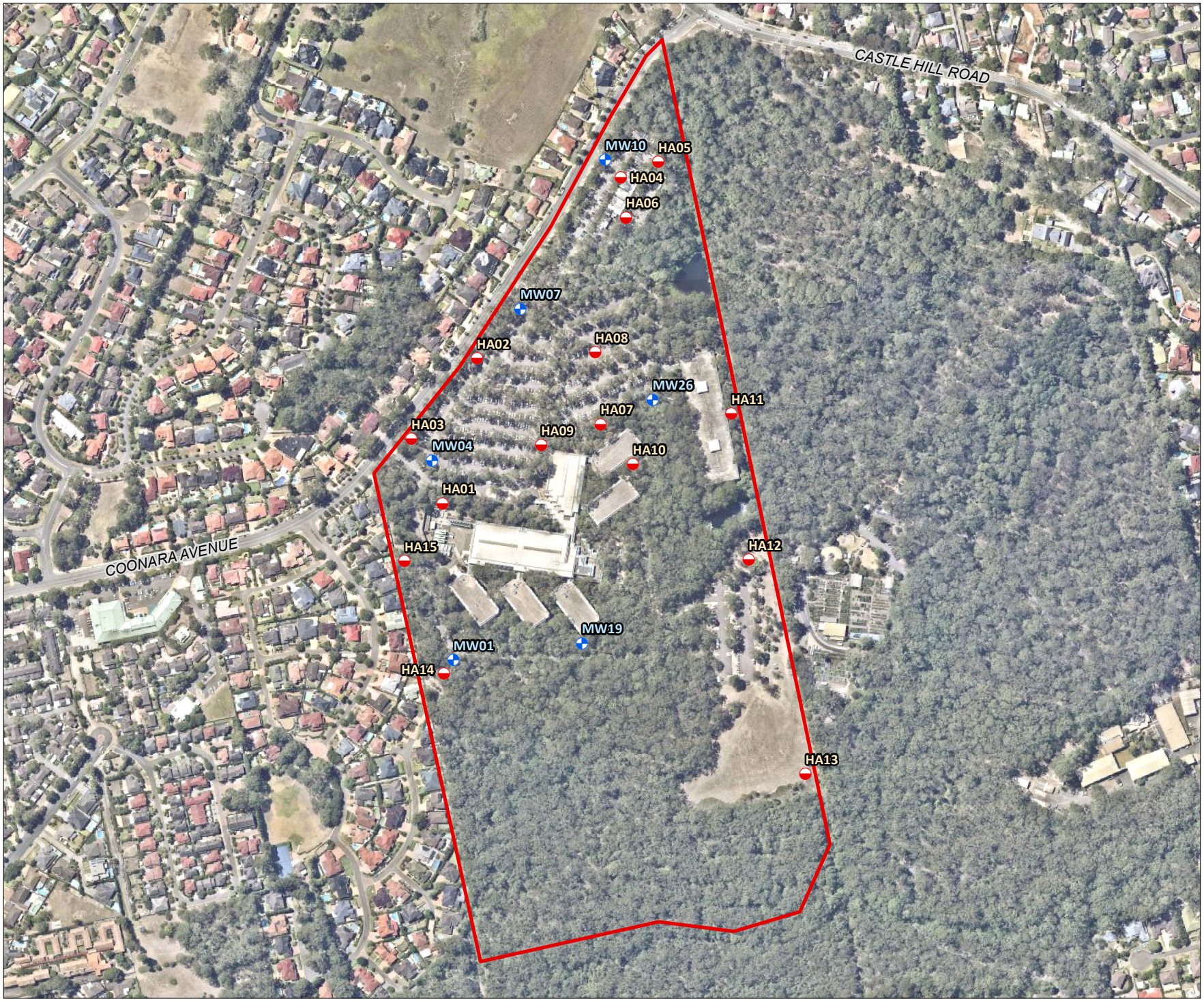
Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

SITE LAYOUT

FIGURE: 2

File Name: 54393_02
Reference: Nearmap - nearmap.com.au - Imagery 18-01-2018



Legend:

- Approximate Site Boundary
- Soil Sample Location
- Monitoring Well Location

JBS&G

Job No: 54393

Client: Mirvac

Version: L01 Rev 0	Checked By: DD
Date 2/05/2018	Drawn By: AV

Scale 1:5,250

0 60 120

metres

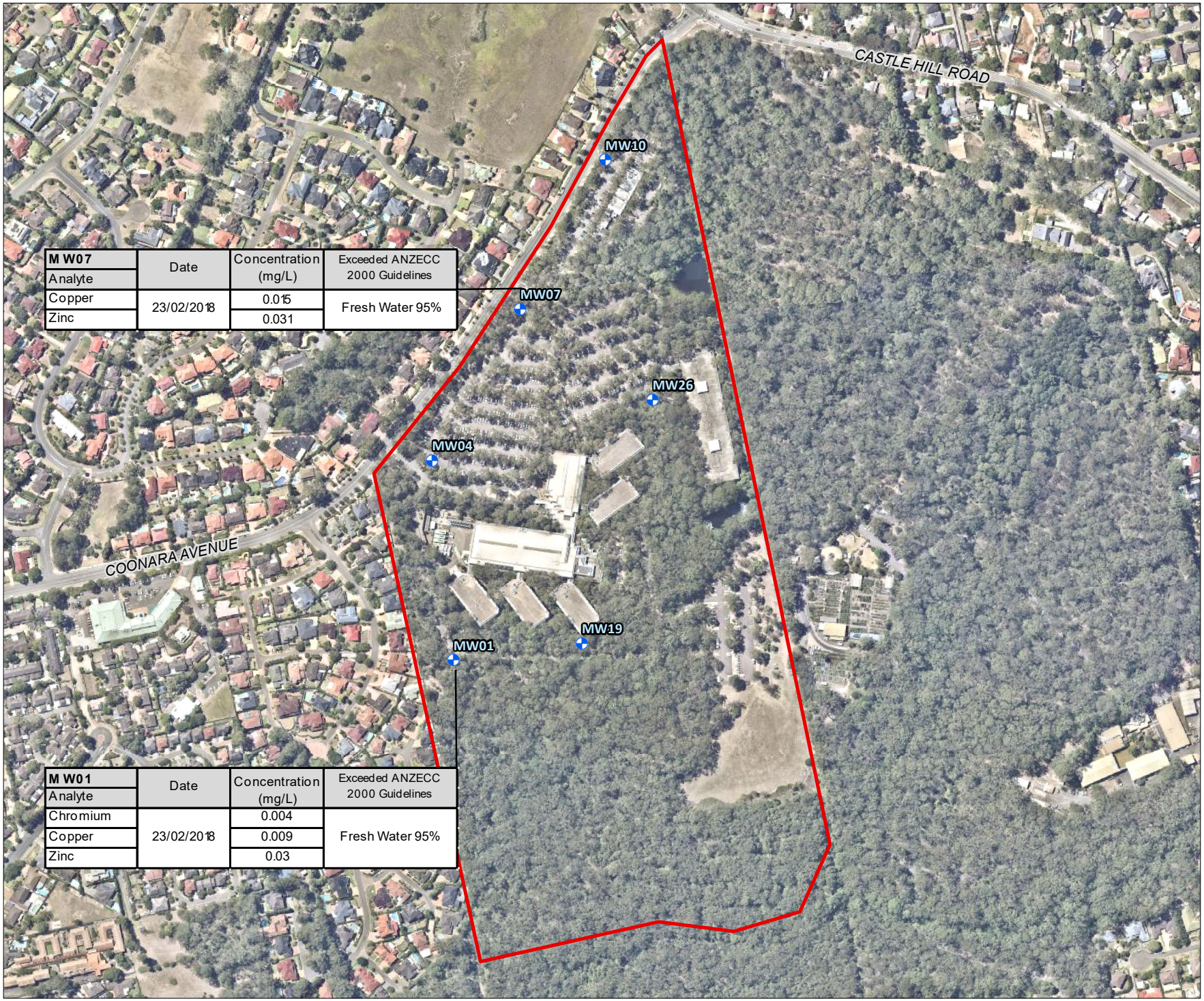
Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

SAMPLE LOCATIONS

FIGURE: 3

File Name: 54393_03
Reference: Nearmap - nearmap.com.au - Imagery 18-01-2018



M W07 Analyte	Date	Concentration (mg/L)	Exceeded ANZECC 2000 Guidelines
Copper	23/02/2018	0.015	Fresh Water 95%
Zinc		0.031	

M W01 Analyte	Date	Concentration (mg/L)	Exceeded ANZECC 2000 Guidelines
Chromium	23/02/2018	0.004	Fresh Water 95%
Copper		0.009	
Zinc		0.03	

Legend:

- Approximate Site Boundary
- Monitoring Well Location

JBS&G

Job No: 54393

Client: Mirvac

Version: L01 Rev 0 | Checked By: DD

Date 2/05/2018 | Drawn By: AV

Scale 1:5,250

0 60 120

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

GROUNDWATER EXCEEDANCES

FIGURE: 4

File Name: 54393_04
Reference: Nearmap - nearmap.com.au - Imagery 18-01-2018

Table A: Soil Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

	Asbestos ID - soils NEPM	VIC IWRG621		Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEX						Polycyclic Aromatic Hydrocarbons																									
	Total Asbestos#1	Organochlorine Pesticides EPAVic	Other Organochlorine Pesticides EPAVic	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	Pyrene	PAHs (Total)	Total Positive PAHs
	g/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.10	0.10	2.00	0.40	1.00	1.00	1.00	0.10	1.00	1.00	20.00	20.00	50.00	50.00	50.00	50.00	100.00	100.00		50.00	20.00	20.00	0.10	0.10	0.10	0.10	0.20	0.30	0.10	0.10	0.10	0.10	0.05	0.50	0.50	0.50	0.50	0.10	0.50	0.10	0.10	0.10	0.10	0.10	0.10		0.10	0.10	0.50	
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL A																																																					
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																																					
NEPM 2013 Soil HIL A				100	20	100	6000	300	40	400	7400															160																						3			300	
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 1 to <2m																					240		70	0.5	NL	220			60																NL					
Field_ID	**LocCode**	**Parent Sample**	**Lab ID**																																																		
HA01_0-0.1	HA01	HA01_0-0.1	586795	-	<0.1	<0.1	5.7	<0.4	14	16	21	<0.1	6	40	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA02_0.3-0.4	HA02	HA02_0.3-0.4	586795	-	<0.1	<0.1	5.2	<0.4	18	15	26	<0.1	5.1	24	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA03_0.0-0.1	HA03	HA03_0.0-0.1	586795	-	<0.1	<0.1	6.4	<0.4	13	17	20	<0.1	<5	30	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA04_0.0-0.1	HA04	HA04_0.0-0.1	586795	-	<0.1	<0.1	4.7	<0.4	12	20	25	<0.1	5	32	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA05_0.3-0.4	HA05	HA05_0.3-0.4	586795	-	<0.1	<0.1	8.7	<0.4	19	23	25	<0.1	7.6	35	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA06_0-0.1	HA06	HA06_0-0.1	586795	-	<0.1	<0.1	5.9	<0.4	14	20	24	<0.1	8.9	42	<20	32	74	<50	106	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA07_0.5-0.6	HA07	HA07_0.5-0.6	586795	-	<0.1	<0.1	17	<0.4	23	12	21	<0.1	6.8	35	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA08_0.3-0.4	HA08	HA08_0.3-0.4	586795	-	<0.1	<0.1	8.6	<0.4	20	19	24	<0.1	6.2	36	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA09_0.3-0.4	HA09	HA09_0.3-0.4	586795	-	<0.1	<0.1	6.1	<0.4	16	21	22	<0.1	5.4	33	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA10_0-0.1	HA10	HA10_0-0.1	586795	-	<0.1	<0.1	5	<0.4	17	13	20	<0.1	5.8	61	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA11_0-0.1	HA11	HA11_0-0.1	586795	-	<0.1	<0.1	<2	<0.4	35	65	<5	<0.1	190	82	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA12_0.3-0.4	HA12	HA12_0.3-0.4	586795	-	<0.1	<0.1	6.4	<0.4	15	10	17	<0.1	<5	20	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA13_0.3-0.4	HA13	HA13_0.3-0.4	586795	-	<0.1	<0.1	4.3	<0.4	11	17	41	<0.1	7.2	55	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA14_0-0.1	HA14	HA14_0-0.1	586795	-	<0.1	<0.1	5.6	<0.4	13	20	30	<0.1	11	460	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
HA15_0.3-0.4	HA15	HA15_0.3-0.4	586795	-	<0.1	<0.1	9.5	<0.4	21	19	22	<0.1	6.9	23	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
QA2302	HA09	HA09_0.3-0.4	586795	-	<0.1	<0.1	5.5	<0.4	14	17	19	<0.1	<5	29	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-
QC2302	QC2302	HA09_0.3-0.4	ENVIROLAB 2018-02-27T00:00:00	<0.1	-	-	5	<0.4	16	20	16	<0.1	10	38	<25	<50	<100	<100	-	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.172	<0.1	<0.1	-	<0.05
Statistical Summary																																																					
Number of Results	1	16	16	17	17	17	17	17	17	17	17	17	17	17	17	16	17	17	17	1	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	16	17	16	17	17	17	17	17	17	17	17	16	1
Number of Detects	0	0	0	16	0	17	17	16	0	14	17	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.1	<0.1	<0.1	<2	<0.4	11	10	<5	<0.1	<5	20	<20	<20	<50	<50	<50	<50	<100	<100	<50	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.172	<0.1	<0.1	<0.5	<0.05
Minimum Detect	ND	ND	ND	4.3	ND	11	10	16	ND	5	20	ND	32	74	ND	106	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.1	<0.1	<0.1	17	<0.4	35	65	41	<0.1	190	460	<25	<50	<100	<100	106	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.05
Maximum Detect	ND	ND	ND	17	ND	35	65	41	ND	190	460	ND	32	74	ND	106	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration		0.05	0.05	6.5	0.2	17	20	22	0.05	17	63	10	12	29	26	30	25	50	50		25	10	10	0.053	0.076	0.062	0.076	0.15	0.17	0.24	0.24	0.24	0.24	0.24	0.25	0.58	1.1	0.25	0.24	0.25	0.24	0.24	0.24	0.24	0.24	0.24	0.57	0.24	0.24	0.25	
Median Concentration	0.05	0.05	0.05	5.7	0.2	16	19	22	0.05	6.2	35	10	10	25	25	25	25	50	50	25	25	10	10	0.05	0.05	0.05	0.05	0.1	0.15	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.605	0.25	0.25	0.25	0.025
Standard Deviation		0	0	3.3	0	5.7	12	7.6	0	45	103	0.61	6.3	13	6.1	20	0	0	0		0	0.61	0.61	0.012	0.11	0.049	0.11	0.22	0.085	0.049	0.049	0.049	0.049	0.055	0	0.085	0.23	0	0.049	0	0.049	0.049	0.049	0.049	0.049	0.049	0.13	0.049	0.049	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table A: Soil Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

	Chlorinated Benzenes	Polychlorinated Biphenyls								Organochlorine Pesticides																				Ionic Balance			Asbestos									
	Hexachlorobenzene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	alpha-Chlordane	beta-BHC	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	Chlordane	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	gamma-Chlordane	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	Cation Exchange Capacity	EC 1:5 soil:water	pH 1:5 soil:water	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	meq/100g	µS/cm	ph Units	g	%w/w	%w/w	g	g	g	g	g	g	g	g
EQL	0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.10	0.05	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.05	0.05	1.00	0.05	10.00	0.10										
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL A																																						0.01								
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																							0.001							
NEPM 2013 Soil HIL A	10								1			6							240	50						10			6			300	20													
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 1 to <2m																																													
Field_ID	**LocCode**	**Parent Sample**	**Lab ID**																																											
HA01_0-0.1	HA01	HA01_0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	73	8	669	0	0	0	0	0	0	0	0	0
HA02_0.3-0.4	HA02	HA02_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	28	5.3	585	0	0	0	0	0	0	0	0	0
HA03_0.0-0.1	HA03	HA03_0.0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	64	5.9	704	0	0	0	0	0	0	0	0	0
HA04_0.0-0.1	HA04	HA04_0.0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	28	6.4	757	0	0	0	0	0	0	0	0	0
HA05_0.3-0.4	HA05	HA05_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	46	6.2	538	0	0	0	0	0	0	0	0	0
HA06_0-0.1	HA06	HA06_0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	41	6.3	594	0	0	0	0	0	0	0	0	0
HA07_0.5-0.6	HA07	HA07_0.5-0.6	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	39	5.2	-	-	-	-	-	-	-	-	-
HA08_0.3-0.4	HA08	HA08_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	23	6	585	0	0	0	0	0	0	0	0	0
HA09_0.3-0.4	HA09	HA09_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	70	5.3	665	0	0	0	0	0	0	0	0	0
HA10_0-0.1	HA10	HA10_0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	66	5.8	624	0	0	0	0	0	0	0	0	0
HA11_0-0.1	HA11	HA11_0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	17	14	6.3	1128	0	0	0	0	0	0	0	0	0
HA12_0.3-0.4	HA12	HA12_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	15	6.2	729	0	0	0	0	0	0	0	0	0
HA13_0.3-0.4	HA13	HA13_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	59	6.4	842	0	0	0	0	0	0	0	0	0
HA14_0-0.1	HA14	HA14_0-0.1	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	0.07	<0.05	-	<0.05	0.07	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	35	6.6	364	0	0	0	0	0	0	0	0	0
HA15_0.3-0.4	HA15	HA15_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	69	6.3	667	0	0	0	0	0	0	0	0	0
QA2302	HA09	HA09_0.3-0.4	586795	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	-	-	632	0	0	0	0	0	0	0	0	0
QC2302	QC2302	HA09_0.3-0.4	ENVIROLAB 2018-02-27T00:00:00	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																																													
Number of Results	17	17	17	17	17	17	17	17	17	17	17	17	17	1	17	17	17	17	17	16	17	17	17	17	1	17	17	16	17	17	17	17	16	1	15	15	15	15	15	15	15	15	15	15	15
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	15	15	15	15	15	15	15	15	15	15	15
Minimum Concentration	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	17	14	5.2	364	0	0	0	0	0	0	0	0	0
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	14	5.2	364	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<1	17	73	8	1128	0	0	0	0	0	0	0	0	0
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	73	8	1128	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.026	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.026	0.026	0.032	0.026		0.026	0.029	0.026	0.026	0.026	0.05	0.026	0.026	0.026	0.026		0.026	0.026	0.025	0.026	0.026	0.026	0.026	0.5		45	6.1	672	0	0	0	0	0	0	0	0	0
Median Concentration	0.025	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.5	17	41	6.2	665	0	0	0	0	0	0	0	0	0
Standard Deviation	0.0061	0	0	0	0	0	0	0	0	0.0061	0.0061	0.021	0.0061		0.0061	0.012	0.0061	0.0061	0.0061	0	0.0061	0.0061	0.0061	0.0061		0.0061	0.0061	0	0.0061	0.0061	0.0061	0.0061	0		21	0.67	166	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table B: Water Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

JBS&G

					Metals & Metalloids							
					Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Total) (Filtered)*	Copper (Filtered)*	Lead (Filtered)*	Mercury (Inorganic) (Filtered)	Nickel (Filtered)*	Zinc (Filtered)*
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANZECC 2000 Fresh Water 95%						0.0002	0.003	0.005	0.0195	0.0006	0.035	0.026
ANZECC 2000 Fresh Water Low Reliability					0.013							
Field_ID	**LocCode**	**WellCode**	**Sample Date**	**Lab ID**								
MW01	MW01	MW01	23/02/2018	586223	<0.001	<0.0002	0.004	0.009	<0.001	<0.0001	0.009	0.03
MW07	MW07	MW07	23/02/2018	586223	<0.001	<0.0002	<0.001	0.015	<0.001	<0.0001	0.002	0.031
MW19	MW19	MW19	23/02/2018	586223	0.008	<0.0002	<0.001	0.003	<0.001	<0.0001	0.011	0.019
QA20180223	QA20180223		23/02/2018	ENVIROLAB 2018-02-23T00:00:00	<0.001	<0.0001	<0.001	0.002	<0.001	<0.00005	0.002	0.023
QC20180223	MW07	MW07	23/02/2018	586223	<0.001	<0.0002	<0.001	0.003	<0.001	<0.0001	0.002	0.025

	Chlorinated Alkanes																	
	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
ANZECC 2000 Fresh Water 95%				6.5														
ANZECC 2000 Fresh Water Low Reliability		0.27	0.4	6.5	0.09								0.24				4	
Field_ID																		
MW01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW07	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW19	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QA20180223	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	-	<0.01
QC20180223	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Statistical Summary

Statistical Summary	Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Total) (Filtered)*	Copper (Filtered)*	Lead (Filtered)*	Mercury (Inorganic) (Filtered)	Nickel (Filtered)*	Zinc (Filtered)*
Number of Results	5	5	5	5	5	5	5	5
Number of Detects	1	0	1	5	0	0	5	5
Minimum Concentration	<0.001	<0.0001	<0.001	0.002	<0.001	<0.00005	0.002	0.019
Minimum Detect	0.008	ND	0.004	0.002	ND	ND	0.002	0.019
Maximum Concentration	0.008	<0.0002	0.004	0.015	<0.001	<0.0001	0.011	0.031
Maximum Detect	0.008	ND	0.004	0.015	ND	ND	0.011	0.031
Average Concentration	0.002	0.00009	0.0012	0.0064	0.0005	0.000045	0.0052	0.026
Median Concentration	0.0005	0.0001	0.0005	0.003	0.0005	0.00005	0.002	0.025
Standard Deviation	0.0034	0.000022	0.0016	0.0055	0	0.000011	0.0044	0.005
Number of Guideline Exceedances	0	0	1	5	0	0	1	5
Number of Guideline Exceedances(Detects Only)	0	0	1	5	0	0	1	5

Statistical Summary	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane
Number of Results	5	5	5	5	5	5	1	5	5	5	1	5	5	5	5	5	4	5
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.01	<0.001	<0.01
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005		0.0005	0.0005	0.0005		0.0005	0.0005	0.0014	0.0014	0.0014	0.0005	0.0014
Median Concentration	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Standard Deviation	0	0	0	0	0	0		0	0	0		0	0	0.002	0.002	0.002	0	0.002
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

* Site specific TVs based on measured $CaCO_3$

Table B: Water Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

	Chlorinated Alkenes													Trihalomethanes				TPHs (NEPC 1999)					TRHs (NEPC 2013)					
	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.10	0.10	0.05	0.10	0.10	0.05	0.01	0.01
ANZECC 2000 Fresh Water 95%																											
ANZECC 2000 Fresh Water Low Reliability	0.7			0.003				0.07			0.33			0.37													
Field_ID	**LocCode**	**WellCode**	**Sample Date**	**Lab ID**																								
MW01	MW01	MW01	23/02/2018	586223	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	0.009	0.002	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02
MW07	MW07	MW07	23/02/2018	586223	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.011	0.014	0.003	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02
MW19	MW19	MW19	23/02/2018	586223	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.008	0.012	0.002	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02
QA20180223	QA20180223		23/02/2018	ENVIROLAB 2018-02-23T00:00:00	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	0.012	0.027	0.003	<0.001	0.024	<0.05	<0.1	<0.1	-	<0.05	<0.1	<0.1	<0.05	0.027	0.027
QC20180223	MW07	MW07	23/02/2018	586223	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.011	0.014	0.003	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02
Statistical Summary																												
Number of Results	5	1	1	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5	0	1	0	0	0	0	0	0	0	0	1	1
Minimum Concentration	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	0.009	0.002	<0.001	<0.02	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	<0.02	<0.02
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.006	0.009	0.002	ND	0.024	ND	ND	ND	ND	ND	ND	ND	ND	0.027	0.027
Maximum Concentration	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	0.012	0.027	0.003	<0.001	0.024	<0.05	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.05	0.027	0.027
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.012	0.027	0.003	ND	0.024	ND	ND	ND	ND	ND	ND	ND	ND	0.027	0.027
Average Concentration	0.0005			0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0014	0.0096	0.015	0.0026	0.0005	0.013	0.025	0.05	0.05	0.05	0.025	0.05	0.05	0.025	0.013	0.013
Median Concentration	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.011	0.014	0.003	0.0005	0.01	0.025	0.05	0.05	0.05	0.025	0.05	0.05	0.025	0.01	0.01
Standard Deviation	0			0	0	0	0	0	0	0	0	0.002	0.0025	0.0069	0.00055	0	0.0063	0	0	0	0	0	0	0	0	0.0076	0.0076
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

* Site specific TVs based on measured $CaCO_3$

Table B: Water Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

	BTEX						Polycyclic Aromatic Hydrocarbons																		
	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (WHO)	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Total)	Total Positive PAHs
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ANZECC 2000 Fresh Water 95%	0.95			0.35																	0.016				
ANZECC 2000 Fresh Water Low Reliability	0.95	0.08	0.18	0.35					0.00001		0.0001							0.001			0.016	0.0006			

Field_ID	LocCode	WellCode	Sample Date	Lab ID																							
MW01	MW01	MW01	23/02/2018	S86223	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00005	<0.00005	<0.00004	<0.00005	<0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-
MW07	MW07	MW07	23/02/2018	S86223	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00005	<0.00005	<0.00004	<0.00005	<0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-
MW19	MW19	MW19	23/02/2018	S86223	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00005	<0.00005	<0.00004	<0.00005	<0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-
QA20180223	QA20180223		23/02/2018	ENVIROLAB 2018-02-23T00:00:00	<0.001	<0.001	<0.001	<0.001	<0.002	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	-	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	-	0
QC20180223	MW07	MW07	23/02/2018	S86223	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00005	<0.00005	<0.00004	<0.00005	<0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-

Statistical Summary

Number of Results	5	5	5	5	5	4	5	5	5	5	5	1	4	5	4	5	5	5	5	5	5	5	5	4	1
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Minimum Concentration	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.00005	<0.00005	<0.00004	<0.00005	<0.00001	<0.0005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.00005	<0.0001	<0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.00005	0
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.0005	0.0005	0.0005	0.0005	0.001	0.0015	0.00003	0.00003	0.000026	0.00003	0.000014		0.000025	0.00003	0.000025	0.00003	0.00003	0.00003	0.00003	0.00003	0.00004	0.00003	0.00003	0.000025	
Median Concentration	0.0005	0.0005	0.0005	0.0005	0.001	0.0015	0.000025	0.000025	0.00002	0.000025	0.000005	0.00025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0.000025	0
Standard Deviation	0	0	0	0	0	0	0.000011	0.000011	0.000013	0.000011	0.00002		0	0.000011	0	0.000011	0.000011	0.000011	0.000011	0.000011	0.000034	0.000011	0.000011	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

* Site specific TVs based on measured $CaCO_3$

Table B: Water Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

	Monocyclic Aromatic Hydrocarbons										VOC	Miscellaneous Hydrocarbons							Chlorinated Benzenes							Solvents		
	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Bromobenzene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene	Total MAH*	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Cyclohexane	Dibromomethane	Iodomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	2-Propanone (Acetone)	Carbon disulfide	Hexachlorobutadiene
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MG/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L
EQL	0.00	0.00		0.00	0.00				0.00		0.00	0.00	0.00	0.00	0.00		0.00	0.00			0.00	0.00	0.00	0.00	0.00	1.00	0.00	
ANZECC 2000 Fresh Water 95%																			0.01	0.17	0.16	0.26	0.06					
ANZECC 2000 Fresh Water Low Reliability																												
Field_ID	**LocCode**	**WellCode**	**Sample Date**	**Lab ID**																								
MW01	MW01	MW01	23/02/2018	586223	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.0001	<5	<0.001	-
MW07	MW07	MW07	23/02/2018	586223	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.0001	<5	<0.001	-
MW19	MW19	MW19	23/02/2018	586223	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.0001	<5	<0.001	-
QA20180223	QA20180223		23/02/2018	ENVIROLAB 2018-02-23T00:00:00	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	-	-	<0.01	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	-	-	<0.001
QC20180223	MW07	MW07	23/02/2018	586223	<0.001	<0.001	-	<0.001	<0.001	-	-	-	<0.001	-	<0.003	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.0001	<5	<0.001	-
Statistical Summary																												
Number of Results	5	5	1	5	5	1	1	1	5	1	4	5	4	4	5	1	5	4	1	1	5	5	5	5	5	4	4	1
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<5	<0.001	<0.001
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<5	<0.001	<0.001
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.0005	0.0005		0.0005	0.0005				0.0005		0.0015	0.0005	0.0005	0.0005	0.0014		0.0005	0.0005			0.0005	0.0005	0.0005	0.0005	0.00006	2.5	0.0005	
Median Concentration	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0015	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.00005	2.5	0.0005	0.0005
Standard Deviation	0	0		0	0				0		0	0	0	0	0.002		0	0			0	0	0	0	0.000022	0	0	
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

* Site specific TVs based on measured $CaCO_3$

Table B: Water Exceedences
Project Number: 54393
Project Name: 55 Coonara Avenue, West Pennant Hills

						Organochlorine Pesticides																				Ionic Balance			EPA VIC IWRG621 (Lab)			
						4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	alpha-Chlordane	beta-BHC	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	Chlordane	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	gamma-Chlordane	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	EC_Lab	Total Alkalinity (as CaCO3)	pH_Lab	Chlorinated Hydrocarbons EPAVic	Other Chlorinated Hydrocarbons EPAVic	Organochlorine Pesticides EPAVic	Other Organochlorine Pesticides EPAVic
						µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	ph Units	µg/L	µg/L	µg/L	µg/L
EQL						0.10	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.00	5.00	0.10	5.00	5.00	1.00	1.00
ANZECC 2000 Fresh Water 95%														0.00001		0.00008						0.00002				0.00009		0.0002		0.0002						
ANZECC 2000 Fresh Water Low Reliability																																				
Field_ID	**LocCode**	**WellCode**	**Sample Date**	**Lab ID**																																
MW01	MW01	MW01	23/02/2018	586223		<0.1	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	2400	180	7.3	9	9	<1	<1
MW07	MW07	MW07	23/02/2018	586223		<0.1	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	260	37	6.6	14	14	<1	<1
MW19	MW19	MW19	23/02/2018	586223		<0.1	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	450	140	6.9	12	12	<1	<1
QA20180223	QA20180223		23/02/2018	ENVIROLAB 2018-02-23T00:00:00		<0.2	<0.0002	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	<0.0002	<0.0002	-	-	41	6.2	-	-	-	-
QC20180223	MW07	MW07	23/02/2018	586223		<0.1	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	270	39	6.6	14	14	<1	<1
Statistical Summary																																				
Number of Results						5	5	4	5	1	5	5	5	5	4	4	5	5	5	5	1	5	5	4	5	5	5	5	4	4	5	5	4	4	4	4
Number of Detects						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5	5	4	4	0	0
Minimum Concentration						<0.1	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	260	37	6.2	9	9	<1	<1
Minimum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	260	37	6.2	9	9	ND	ND
Maximum Concentration						<0.2	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0002	<0.01	2400	180	7.3	14	14	<1	<1
Maximum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2400	180	7.3	14	14	ND	ND
Average Concentration						0.06	0.00006	0.00005	0.00006		0.00006	0.00006	0.00006	0.00006	0.00005	0.0005	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00006	0.00005	0.00006	0.00006	0.00006	0.00006	0.005	845	87	6.7	12	12	0.5	0.5
Median Concentration						0.05	0.00005	0.00005	0.00005	0.0001	0.00005	0.00005	0.00005	0.00005	0.00005	0.0005	0.00005	0.00005	0.00005	0.00005	0.0001	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.00005	0.005	360	41	6.6	13	13	0.5	0.5
Standard Deviation						0.022	0.000022	0	0.000022		0.000022	0.000022	0.000022	0.000022	0	0	0.000022	0.000022	0.000022	0.000022		0.000022	0.000022	0	0.000022	0.000022	0.000022	0.000022	0	1040	68	0.41	2.4	2.4	0	0
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	5	0	4	0	0	0	0	0	5	0	0	5	0	0	0	4	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments

* Site specific TVs based on measured $CaCO_3$

Table C - Soil Analytical Results - Waste Classification (Preliminary)
Project Number: 54393
Project Name: 55 Coonara Rd, West Pennant Hills DD

			Metals & Metalloids									TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEX					
			Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			2.00	0.40	1.00	1.00	1.00	0.10	1.00	-	1.00	20.00	20.00	50.00	50.00	50.00	50.00	100.00	100.00		50.00	20.00	20.00	0.10	0.10	0.10	0.10	0.20	0.30
NSW EPA 2014 General Solid Waste (No Leaching)			100	20			100	4	40			650				10000								10	600	288			1000
NSW EPA 2014 General Solid Waste (with leached)			500	100			1500	50	1050	2		650				10000								18	1080	518			1800
Field_ID	**Sampled_Date-Time**	**Lab_Report_Number**																											
HA01_0-0.1	23/02/2018	586795	5.7	<0.4	14	16	21	<0.1	6	-	40	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA02_0.3-0.4	23/02/2018	586795	5.2	<0.4	18	15	26	<0.1	5.1	-	24	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA03_0.0-0.1	23/02/2018	586795	6.4	<0.4	13	17	20	<0.1	<5	-	30	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA04_0.0-0.1	22/02/2018	586795	4.7	<0.4	12	20	25	<0.1	5	-	32	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA05_0.3-0.4	22/02/2018	586795	8.7	<0.4	19	23	25	<0.1	7.6	-	35	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA06_0-0.1	22/02/2018	586795	5.9	<0.4	14	20	24	<0.1	8.9	-	42	<20	32	74	<50	106	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA07_0.5-0.6	23/02/2018	586795	17	<0.4	23	12	21	<0.1	6.8	-	35	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA08_0.3-0.4	22/02/2018	586795	8.6	<0.4	20	19	24	<0.1	6.2	-	36	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA09_0.3-0.4	23/02/2018	586795	6.1	<0.4	16	21	22	<0.1	5.4	-	33	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA10_0-0.1	23/02/2018	586795	5	<0.4	17	13	20	<0.1	5.8	-	61	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA11_0-0.1	23/02/2018	586795	<2	<0.4	35	65	<5	<0.1	190	0.03	82	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA12_0.3-0.4	21/02/2018	586795	6.4	<0.4	15	10	17	<0.1	<5	-	20	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA13_0.3-0.4	21/02/2018	586795	4.3	<0.4	11	17	41	<0.1	7.2	-	55	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA14_0-0.1	21/02/2018	586795	5.6	<0.4	13	20	30	<0.1	11	-	460	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
HA15_0.3-0.4	21/02/2018	586795	9.5	<0.4	21	19	22	<0.1	6.9	-	23	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QA2302	23/02/2018	586795	5.5	<0.4	14	17	19	<0.1	<5	-	29	<20	<20	<50	<50	<50	<50	<100	<100	-	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QC2302	23/02/2018	186043	5	<0.4	16	20	16	<0.1	10	-	38	<25	<50	<100	<100	-	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1
Statistical Summary																													
Number of Results			17	17	17	17	17	17	17		17	17	17	17	17	16	17	17	17	1	17	17	17	17	17	17	17	17	17
Number of Detects			16	0	17	17	16	0	14		17	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<2	<0.4	11	10	<5	<0.1	<5		20	<20	<20	<50	<50	<50	<50	<100	<100	<50	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
Minimum Detect			4.3	ND	11	10	16	ND	5		20	ND	32	74	ND	106	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			17	<0.4	35	65	41	<0.1	190		460	<25	<50	<100	<100	106	<50	<100	<100	<50	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1
Maximum Detect			17	ND	35	65	41	ND	190		460	ND	32	74	ND	106	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration			6.5	0.2	17	20	22	0.05	17		63	10	12	29	26	30	25	50	50		25	10	10	0.053	0.076	0.062	0.076	0.15	0.17
Median Concentration			5.7	0.2	16	19	22	0.05	6.2		35	10	10	25	25	25	25	50	50	25	25	10	10	0.05	0.05	0.05	0.05	0.1	0.15
Standard Deviation			3.3	0	5.7	12	7.6	0	45		103	0.61	6.3	13	6.1	20	0	0	0		0	0.61	0.61	0.012	0.11	0.049	0.11	0.22	0.085
Number of Guideline Exceedances			0	0	0	0	0	0	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)			0	0	0	0	0	0	1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table C - Soil Analytical Results - Waste Classification (Preliminary)
Project Number: 54393
Project Name: 55 Coonara Rd, West Pennant Hills DD

				Polycyclic Aromatic Hydrocarbons																					Polychlorinated Biphenyls							
				Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	PAHs (Total)	Pyrene	Total Positive PAHs	HexaChlorobenzene	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.10	0.10	0.10	0.10	0.05	0.50	0.50	0.50	0.50	0.10	0.50	0.10	0.10	0.10	0.10	0.10	0.10		0.10	0.50	0.10		0.05	0.10	0.10	0.10	0.10	0.10	0.10	0.10
NSW EPA 2014 General Solid Waste (No Leaching)								0.8																									50-0
NSW EPA 2014 General Solid Waste (with leached)								10																									50-0
Field_ID	**Sampled_Date-Time**	**Lab_Report_Number**																															
HA01_0-0.1	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA02_0.3-0.4	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA03_0.0-0.1	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA04_0.0-0.1	22/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA05_0.3-0.4	22/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA06_0-0.1	22/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA07_0.5-0.6	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA08_0.3-0.4	22/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA09_0.3-0.4	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA10_0-0.1	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA11_0-0.1	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA12_0.3-0.4	21/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA13_0.3-0.4	21/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA14_0-0.1	21/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HA15_0.3-0.4	21/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QA2302	23/02/2018	586795		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	-	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC2302	23/02/2018	186043		<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.172	<0.1	-	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Statistical Summary																																	
Number of Results				17	17	17	17	17	17	17	17	16	17	16	17	17	17	17	17	17	17	17	16	17	1	17	17	17	17	17	17	17	17
Number of Detects				0	0	0	0	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration				<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	<0.1	<0.5	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.172	<0.1	<0.5	<0.1	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Minimum Detect				ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21	<0.5	<0.5	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Maximum Detect				ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration				0.24	0.24	0.24	0.24	0.24	0.25	0.58	1.1	0.25	0.24	0.25	0.24	0.24	0.24	0.24	0.24	0.24	0.57	0.24	0.25	0.24		0.026	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Median Concentration				0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.605	0.25	0.25	0.25	0.025	0.025	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation				0.049	0.049	0.049	0.049	0.055	0	0.085	0.23	0	0.049	0	0.049	0.049	0.049	0.049	0.049	0.049	0.13	0.049	0	0.049		0.0061	0	0	0	0	0	0	0	0
Number of Guideline Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17

Table C - Soil Analytical Results - Waste Classification (Preliminary)
Project Number: 54393
Project Name: 55 Coonara Rd, West Pennant Hills DD

			Organochlorine Pesticides																								Ionic Balance			Asbestos										Other	
			4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	alpha-Chlordane	beta-BHC	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	Chlordane	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	gamma-Chlordane	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	Cation Exchange Capacity	EC 1:5 soil:water	pH 1:5 soil:water	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	% Moisture 103oC	Moisture
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	meq/100g	µS/cm	ph Units	g	%w/w	%w/w	g	g	g	g	g	g	g	%	%
EQL			0.05	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.10	0.05	0.05	0.05	0.05	0.05		0.05	0.05	0.05	0.05	0.05	0.05	1.00	0.05	10.00	0.10											1.00	
NSW EPA 2014 General Solid Waste (No Leaching)															60	60	60																							
NSW EPA 2014 General Solid Waste (with leached)															108	108	108																							
Field_ID	**Sampled_Date-Time**	**Lab_Report_Number**																																						
HA01_0-0.1	23/02/2018	586795	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	73	8	669	0	0	0	0	0	0	0	0	0	7.8	-
HA02_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	28	5.3	585	0	0	0	0	0	0	0	0	0	27	-
HA03_0.0-0.1			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	64	5.9	704	0	0	0	0	0	0	0	0	0	6.5	-
HA04_0.0-0.1			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	28	6.4	757	0	0	0	0	0	0	0	0	0	27	-
HA05_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	46	6.2	538	0	0	0	0	0	0	0	0	0	15	-
HA06_0-0.1			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	41	6.3	594	0	0	0	0	0	0	0	0	0	8.2	-
HA07_0.5-0.6			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	39	5.2	-	-	-	-	-	-	-	-	-	-	7.9	-
HA08_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	23	6	585	0	0	0	0	0	0	0	0	0	11	-
HA09_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	70	5.3	665	0	0	0	0	0	0	0	0	0	10	-
HA10_0-0.1			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	66	5.8	624	0	0	0	0	0	0	0	0	0	12	-
HA11_0-0.1			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	17	14	6.3	1128	0	0	0	0	0	0	0	0	0	3.4	-
HA12_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	15	6.2	729	0	0	0	0	0	0	0	0	0	12	-
HA13_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	59	6.4	842	0	0	0	0	0	0	0	0	0	10	-
HA14_0-0.1			<0.05	<0.05	0.07	<0.05	-	<0.05	0.07	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	35	6.6	364	0	0	0	0	0	0	0	0	0	18	-
HA15_0.3-0.4			<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	69	6.3	667	0	0	0	0	0	0	0	0	0	16	-
QA2302	23/02/2018	586795	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	-	-	-	632	0	0	0	0	0	0	0	0	0	7.2	-
QC2302	23/02/2018	186043	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.5
Statistical Summary																																								
Number of Results			17	17	17	17	1	17	17	17	17	17	16	17	17	17	17	17	1	17	16	17	17	17	17	16	1	15	15	15	15	15	15	15	15	15	15	15	16	1
Number of Detects			0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	15	15	15	15	15	15	15	15	15	15	15	16	1
Minimum Concentration			<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<1	17	14	5.2	364	0	0	0	0	0	0	0	0	0	3.4	6.5
Minimum Detect			ND	ND	0.07	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	14	5.2	364	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	6.5
Maximum Concentration			<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	17	73	8	1128	0	0	0	0	0	0	0	0	0	27	6.5
Maximum Detect			ND	ND	0.07	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	17	73	8	1128	ND	ND	ND	ND	ND	ND	ND	ND	ND	27	6.5
Average Concentration			0.026	0.026	0.032	0.026		0.026	0.029	0.026	0.026	0.026	0.05	0.026	0.026	0.026	0.026	0.026		0.026	0.025	0.026	0.026	0.026	0.026	0.5		45	6.1	672	0	0	0	0	0	0	0	0	0	12	
Median Concentration			0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.5	17	41	6.2	665	0	0	0	0	0	0	0	0	0	10.5	6.5
Standard Deviation			0.0061	0.0061	0.021	0.0061		0.0061	0.012	0.0061	0.0061	0.0061	0	0.0061	0.0061	0.0061	0.0061	0.0061		0.0061	0	0.0061	0.0061	0.0061	0.0061	0		21	0.67	166	0	0	0	0	0	0	0	0	0	6.8	
Number of Guideline Exceedances			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Attachment 3 – Section 149 Certificate

THE HILLS SHIRE COUNCIL
3 Columbia Court, Baulkham Hills NSW 2153
PO Box 7064, Baulkham Hills BC NSW 2153
Telephone +61 2 9843 0555
Facsimilie +61 2 9843 0409
Email council@thehills.nsw.gov.au
www.thehills.nsw.gov.au
DX 9966 Norwest
ABN No. 25 034 494 656

PLANNING CERTIFICATE UNDER SECTION 149 (2) & (5)

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 AS AMENDED.

Certificate Number:	**61107**
Reference:	54939:103766
Issue Date:	11 December 2017
Receipt No:	5621725
Fee Paid:	$ 133.00

ADDRESS:	55 Coonara Avenue, WEST PENNANT HILLS NSW 2125
DESCRIPTION:	Lot 61 DP 737386

The land is zoned:
Zone B7 Business Park

The following prescribed matters apply to the land to which this certificate relates:

The Environmental Planning and Assessment Amendment Act 1997 commenced operation on 1 July 1998. As a consequence of this Act, the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment Regulation 2000.

PLEASE NOTE: THIS CERTIFICATE IS AUTOMATICALLY GENERATED. IT MAY CONTAIN EXCESSIVE SPACES AND/OR BLANK PAGES.

THIS CERTIFICATE IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 149 (2) OF THE ABOVE ACT.

1. Names of relevant planning instruments and DCPs

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

(A) **Local Environmental Plans**

The Hills Local Environmental Plan 2012, as amended, applies to all land in the Shire unless otherwise stated in this certificate.

State Environmental Planning Policies

SEPP No.19 - Bushland In Urban Areas
SEPP No.21 - Caravan Parks
SEPP No.30 - Intensive Agriculture
SEPP No.33 - Hazardous And Offensive Development
SEPP No.50 - Canal Estate Development
SEPP No.55 - Remediation Of Land
SEPP No.62 - Sustainable Aquaculture
SEPP No.64 - Advertising And Signage
SEPP No.65 - Design Quality Of Residential Apartment Development
SEPP No.70 - Affordable Housing (Revised Schemes)
SEPP (Building Sustainability Index: Basix) 2004
SEPP (State Significant Precincts) 2005
SEPP (Mining, Petroleum Production And Extractive Industries) 2007
SEPP (Miscellaneous Consent Provisions) 2007
SEPP (Infrastructure) 2007
SEPP (Exempt and Complying Development Codes) 2008
SEPP (Affordable Rental Housing) 2009
SEPP (State and Regional Development) 2011

SEPP (Vegetation in Non-Rural Areas) 2017
SEPP (Educational Establishments and Child Care Facilities) 2017
Sydney Regional Environmental Plan No. 9 Extractive Industry (No.2 - 1995)

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

The following SEPP's may apply to the land. Please refer to **'Land to which Policy applies'** for each individual SEPP.

SEPP (Housing For Seniors Or People With A Disability) 2004

(2) The name of each **proposed environmental planning instrument** that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

(A) **Proposed Local Environmental Plans**

Proposed The Hills Local Environmental Plan 2012 (Amendment No.) applies to this land.

Refer Attachment 1(2)(A)

(B) **Proposed State Environmental Planning Policies**

Draft Primary Production and Rural Development State Environmental Planning Policy and planning reforms
Draft State Environmental Planning Policy (Environment)

(3) The name of each development control plan that applies to the carrying out of development on the land.

The Hills Development Control Plan 2012

Note: the land is within The Hills Development Control Plan 2012 Part B map sheet. Refer Council's website www.thehills.nsw.gov.au to view the map sheet.

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a LEP or a draft environmental planning instrument.

2. Zoning and land use under relevant LEPs

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP).

(A) The Hills Local Environmental Plan 2012 applies to the land unless otherwise stated in this certificate and identifies the land to be:

Zone B7 Business Park

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

(F) Whether the land includes or comprises critical habitat?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

(G) Whether the land is in a conservation area (however described)?

The Hills Local Environmental Plan 2012?

NO

Any Other Planning Proposal?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

2A. Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006

To the extent that the land is within any zone (however described) under:

(a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (the 2006 SEPP), or*

(b) a Precinct Plan (within the meaning of the 2006 SEPP), or

(c) a proposed Precinct Plan that is or has been the subject of community consultation or on public exhibition under the ACT.

(A) State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan) does not apply.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) applies to the land unless otherwise stated in this certificate and identifies the land to be:

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan) does not apply.

Note: This precinct plan applies to land within the Box Hill Precinct or Box Hill Industrial Precinct.

(B) The purposes for which the instrument provides that development may be carried out within the zone without development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Exempt Development.

(C) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent:

Refer Attachment 2(B)

Also refer to the applicable instrument for provisions regarding Complying Development

(D) The purposes for which the instrument provides that development is prohibited in the zone:

Refer Attachment 2(B)

(E) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

Any amendments to State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

Any amendments to State Environmental Planning Policy (Sydney Region Growth Centres 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(F) Whether the land includes or comprises critical habitat?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(G) Whether the land is in a conservation area (however described)?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

(H) Whether an item of environmental heritage (however described) is situated on the land?

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct Plan)?

NO

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 11 The Hills Growth Centre Precincts Plan)?

NO

3. Complying Development

(1) The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

(2) The extent to which complying development may not be carried out on that land because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18 (1) (c3) and 1.19 of that Policy and the reasons why it may not be carried out under those clauses.

(3) If the council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

Housing Code and Rural Housing Code
Complying Development under the Housing Code and Rural Housing Code **may be** carried out on the land.

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

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

Commercial and Industrial Alterations, Container Recycling Facilities, Subdivision, Demolition and Fire Safety Codes
Complying Development under the Commercial and Industrial Alterations, Subdivision, Demolition and Fire Safety Codes **may be** carried out on the land.

Note: Where reference is made to an applicable map, this information can be sourced from the following websites:

The Hills Local Environmental Plan 2012 - www.thehills.nsw.gov.au
State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (Appendix 2 North Kellyville Precinct) or (Appendix 11 The Hills Growth Centre Precincts Plan) – http://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/North-West-Priority-Growth-Area

4. Coastal protection

Whether or not the land is affected by the operation of Section 38 or 39 of the *Coastal Protection Act 1979*, but only to the extent that the council has been so notified by the Department of Finance, Services, and Innovation?

NO

4A. Certain information relating to beaches and coasts

(1) In relation to a coastal council - whether an order has been made under Part 4D of the *Coastal Protection Act 1979* in relation to temporary coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

NO

(2) In relation to a coastal council:

(a) whether the council has been notified under section 55X of the *Coastal Protection Act 1979* that temporary coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and

(b) if works have been so placed – whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

NO

(3) (Repealed)

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

Whether the owner (or any previous owner) of the land has 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 (within the meaning of section 553B of that Act).

NO

Note. "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the *Local Government Act 1993*.

5. Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act 1961*?

NO

6. Road widening and road realignment

Whether or not the land is affected by any road widening or road realignment under -

(A) Division 2 of Part 3 of the *Roads Act 1993*; or

NO

(B) any environmental planning instrument; or

NO

(C) any resolution of council?

a) The Hills Development Control Plan 2012?

NO

b) Any other resolution of council?

NO

7. Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(a) adopted by council, or

(b) adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council,

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)?

Council's policies on hazard risk restrictions are as follows:

(i) Landslip

a) By The Hills Local Environmental Plan 2012 zoning?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

b) By The Hills Local Environmental Plan 2012 local provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

c) By The Hills Development Control Plan 2012 provision?

NO

No resolution has been adopted but attention is directed to the fact that there are areas within the Shire liable to landslip.

(ii) Bushfire

YES

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by bushfire. That question is answered in Section 11 of this certificate.

Council has adopted the NSW Rural Fire Service Guidelines entitled 'Planning for Bushfire Protection 2006'. Development subject to bushfire risk will be required to address the requirements in these guidelines and can be downloaded off the RFS web site www.rfs.nsw.gov.au

The Development Control Plan may also contain provisions for development on Bushfire Prone Land and Bushfire Hazard Management. Refer Part 1(3) of this certificate for the applicable Development Control Plan.

(iii) Tidal inundation

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by tidal inundation.

(iv) Subsidence

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by subsidence.

(v) Acid sulphate soils

NO

(vi) Land contamination

NO

Please note this is a statement of Council policy only and NOT a statement on whether or not the property is affected by contamination or potential contamination.

(vii) Any other risk

NO

7A. Flood related development controls information

(1) Whether or not development on that land or part of the 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 seniors housing) is subject to flood related development controls?

NO

Please note this is a statement of flood related development controls and is NOT a statement on whether or not the property is subject to flooding.

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls?

YES

Please note this is a statement that flood related development controls apply to the land and is NOT a statement on whether or not the property is subject to flooding.

(3) Words and expressions in this clause have the same meanings as in the standard instrument set out in the *Standard Instrument (Local Environmental Plans) Order 2006*.

8. Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

The Hills Local Environmental Plan 2012?

NO

Any other Planning Proposal?

NO

State Environmental Planning Policy?

NO

Proposed State Environmental Planning Policy?

NO

9. Contributions plans

The name of each contributions plan applying to the land:

THE HILLS SECTION 94A

9A. Biodiversity Certified Land

Whether the land is biodiversity certified land under Part 8 of the *Biodiversity Conservation Act 2016*?

NO

Note: Biodiversity certified land includes land certified under Part 7AA of the *Threatened Species Conservation Act 1995* that is taken to be certified under Part 8 of the *Biodiversity Conservation Act 2016*.

10. Biodiversity stewardship sites

Whether the land is a biodiversity stewardship site under a biodiversity stewardship agreement under Part 5 of the *Biodiversity Conservation Act 2016* (but only if the council has been notified of the existence of the agreement by the Chief Executive of the Office of Environment and Heritage)?

NO

Note: Biodiversity stewardship agreements include biobanking agreements under Part 7A of the *Threatened Species Conservation Act 1995* that are taken to be biodiversity stewardship agreements under Part 5 of the *Biodiversity Conservation Act 2016*.

10A. Native vegetation clearing set asides

Whether the land contains a set aside area under section 60ZC of the *Local Land Services Act 2013* (but only if the council has been notified of the existence of the set aside area by Local Land Services or it is registered in the public register under that section)?

NO

11. Bush fire prone land

Has the land been identified as bush fire prone land?

YES

The land is identified on Council's certified Bush Fire Prone Land map as being partly or wholly bush fire prone land. For details refer to the Bush Fire Prone Land map that can be viewed on Council's website at www.thehills.nsw.gov.au

12. Property vegetation plans

Has the council been notified that a property vegetation plan approved under Part 4 of the *Native Vegetation Act 2003* (and that continues in force) applies to this land?

NO

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

Whether an order has been made under the *Trees (Disputes Between Neighbours) Act 2006* to carry out work in relation to a tree on this land (but only if the council has been notified of the order)?

NO

14. Directions under Part 3A

Whether there is a direction by the Minister in force under section 75P (2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect?

NO

15. Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing) of which council is aware, issued under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* in respect of proposed development on the land?

NO

(b) Whether there are any terms of a kind referred to in clause 18(2) of *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land?

NO

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

Whether there is a valid site compatibility certificate (infrastructure) or site compatibility certificate (schools or TAFE establishments), of which the council is aware, in respect of proposed development on the land?

NO

17. Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land?

NO

(2) Whether there are any terms of a kind referred to in clause 17(1) or 38(1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that have been imposed as a condition of consent to a development application in respect of the land?

NO

18. Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

NO DEVELOPMENT PLAN APPLIES

(2) The date of any subdivision order that applies to the land.

NO SUBDIVISION ORDER APPLIES

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

19. Site verification certificates

Whether there is a current site verification certificate, of which the council is aware, in respect of the land?

NO

Note. A site verification certificate sets out the Secretary'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

Does the land include any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that is listed on the Loose-Fill Asbestos Insulation Register that is required to be maintained under that Division?

Council has **not** been notified by NSW Fair Trading that the land includes any residential premises that are listed on the register. Refer to the NSW Fair Trading website at www.fairtrading.nsw.gov.au to confirm that the land is not listed on this register.

Note: There is potential for loose-fill asbestos insulation in residential premises that are not listed on the Register. Contact NSW Fair Trading for further information.

Note. The following matters are prescribed by section 59 (2) of the *Contaminated Land Management Act 1997* as additional matters to be specified in a planning certificate:

(a) that the land to which the certificate relates is significantly contaminated land within the meaning of that Act – if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

NO

(b) that the land to which the certificate relates is subject to a management order within the meaning of that Act – if it is subject to such an order at the date when the certificate is issued,

NO

(c) that the land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act – if it is the subject of such an approved proposal at the date when the certificate is issued,

NO

(d) that the land to which the certificate relates is subject to an ongoing maintenance order within the meaning of the Act – if it is subject to such an order at the date when the certificate is issued,

NO

(e) that the land to which the certificate relates is the subject of a site audit statement within the meaning of the Act – if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

NO

THIS PART IS DIRECTED TO THE FOLLOWING MATTERS PRESCRIBED UNDER SECTION 149 (5) OF THE ABOVE ACT

NOTE: "When information pursuant to Section 149 (5) is requested the council is under no obligation to furnish any of the information supplied herein pursuant to that Section. Council draws your attention to Section 149 (6), which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate."

A. Whether there are any provisions applying to the land that control the management of trees and bushland?

YES

Part C Section 3 of The Hills Development Control Plan 2012 contain provisions for the control and management of actions in respect of trees and bushland.

B. Does the land contain a foreshore area as identified on The Hills Local Environmental Plan 2012 Foreshore Building Line map?

NO

C. Under the Protection of the Environment Operations Act 1997, is the property subject to a listing on the public register maintained by council with respect to an environmental notice or civil proceedings in the Land and Environment Court, or a prosecution under this Act?

NO

D. Is the land affected by any special provisions of Sydney Regional Environmental Plan No 9 – Extractive Industry (No 2 – 1995)?

NO

E. Is the land affected by a restricted development area as identified under The Hills Development Control Plan 2012?

YES

Refer to Council's website www.thehills.nsw.gov.au to view the relevant The Hills Development Control Plan 2012 map sheet.

F. Is the land within an area where a Special Infrastructure Contribution, as determined by the Minister for Planning and Infrastructure, applies?

NO

G. Is the land in the vicinity of a heritage item or heritage conservation area as described in The Hills Local Environmental Plan 2012 **OR** State Environmental Planning Policy (Sydney Region Growth Centres) 2006?

YES

Clause 5.10 (5) of The Hills Local Environmental Plan 2012 provides specific considerations for development in the vicinity of a heritage item or heritage conservation area.

H. Whether Council has adopted a Voluntary Planning Agreement within the meaning of S93F of the Environmental Planning and Assessment Act, 1979, as amended, in relation to the land?

NO

I. Is the land within or adjacent to the Sydney Metro Northwest as identified on the maps prepared by Transport NSW?

NO

J. Does the land contain a proposed road as identified within a Development Control Plan under State Environmental Planning Policy (Sydney Region Growth Centres) 2006?

NO

K. Has Council been notified by NSW Land and Property Information that the land is affected by a plan of acquisition for railway purposes (Sydney Metro Northwest)?

NO

THE HILLS SHIRE COUNCIL

MICHAEL EDGAR
GENERAL MANAGER

Per: Stewart Seale.

PLEASE NOTE: COUNCIL RETAINS THE ELECTRONIC ORIGINAL OF THIS CERTIFICATE. WHERE THIS CERTIFICATE REFERS TO INFORMATION DISPLAYED ON COUNCIL'S WEBSITE OR TO ANY EXTERNAL WEBSITE, IT REFERS TO INFORMATION DISPLAYED ON THE WEBSITE ON THE DATE THIS CERTIFICATE IS ISSUED.

ATTACHMENT 1(2)(A)

PLANNING PROPOSAL 1/2017/PLP - REMOVES CITY OF PARRAMATTA FROM THE HILLS SHIRE COUNCIL & CREATES LEP 2017

As a result of the State-wide Council Boundary Review process in May 2016, the Hills Shire Council area was reduced, with part of The Hills Shire becoming part of the new City of Parramatta Council Local Government Area.

This means that LEP 2012 is currently being administered by two Councils. The planning proposal seeks an administrative amendment to The Hills Local Environmental Plan 2012 to:

1. Create a new local environmental plan and associated maps which will be known as *The Hills Local Environmental Plan 2017* and which will apply to land within The Hills Local Government Area.

2. Amend *The Hills Local Environmental Plan 2012* and associated maps so that it only applies to land formerly in The Hills Local Government Area, now in the City of Parramatta. This instrument will continue to be known as *The Hills Local Environmental Plan 2012.*

The separation of LEP 2012 into two plans will allow both Councils to manage the ongoing planning framework independently. The proposal is an administrative amendment only and there is no proposal to change the planning controls that currently apply to land within The Hills Shire or the City of Parramatta.

Delegation for making of the LEP 2012 has not been issued to Council under the Gateway Determination.

For further information please contact Council's Duty Planner on 9843 0469.

The above details are in keeping with the exhibited planning proposal. Please note that changes to the planning proposal may be made post exhibition. The current status and details of the planning proposal can be viewed on Council's website www.thehills.nsw.gov.au under the 'Building & Planning' menu bar, then 'Application Tracking'.

ATTACHMENT 2(B)

Zone B7 Business Park

1 Objectives of zone

- To provide a range of office and light industrial uses.
- To encourage employment opportunities.
- To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.
- To make provision for high technology industries that use and develop advanced technologies, products and processes.

2 Permitted without consent

Nil

3 Permitted with consent

Building identification signs; Business identification signs; Business premises; Centre-based child care facilities; Food and drink premises; Garden centres; Hardware and building supplies; Heliports; Hotel or motel accommodation; Landscaping material supplies; Light industries; Neighbourhood shops; Office premises; Passenger transport facilities; Plant nurseries; Roads; Respite day care centres; Self storage units; Serviced apartments; Timber yards; Vehicle sales or hire premises; Warehouse or distribution centres; Any other development not specified in item 2 or 4

4 Prohibited

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Environmental facilities; Exhibition homes; Exhibition villages; Farm buildings; Forestry; Freight transport facilities; Heavy industrial storage establishments; Highway service centres; Home-based child care; Home businesses; Home occupations; Home occupations (sex services); Industrial training facilities; Industries; Jetties; Marinas; Mooring pens; Moorings; Open cut mining; Port facilities; Recreation facilities (major); Research stations; Residential accommodation; Resource recovery facilities; Restricted premises; Rural industries; Sewerage systems; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Waste disposal facilities; Water recreation structures; Water supply systems; Wharf or boating facilities

NOTE: This land use table should be read in conjunction with the Dictionary at the end of The Hills LEP 2012 which defines words and expressions for the purpose of the plan.

NOTE: Activities permitted without development consent are still subject to other provisions in Environmental Planning Instruments and/or Acts.

Attachment 4 – Aerial Photographs

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

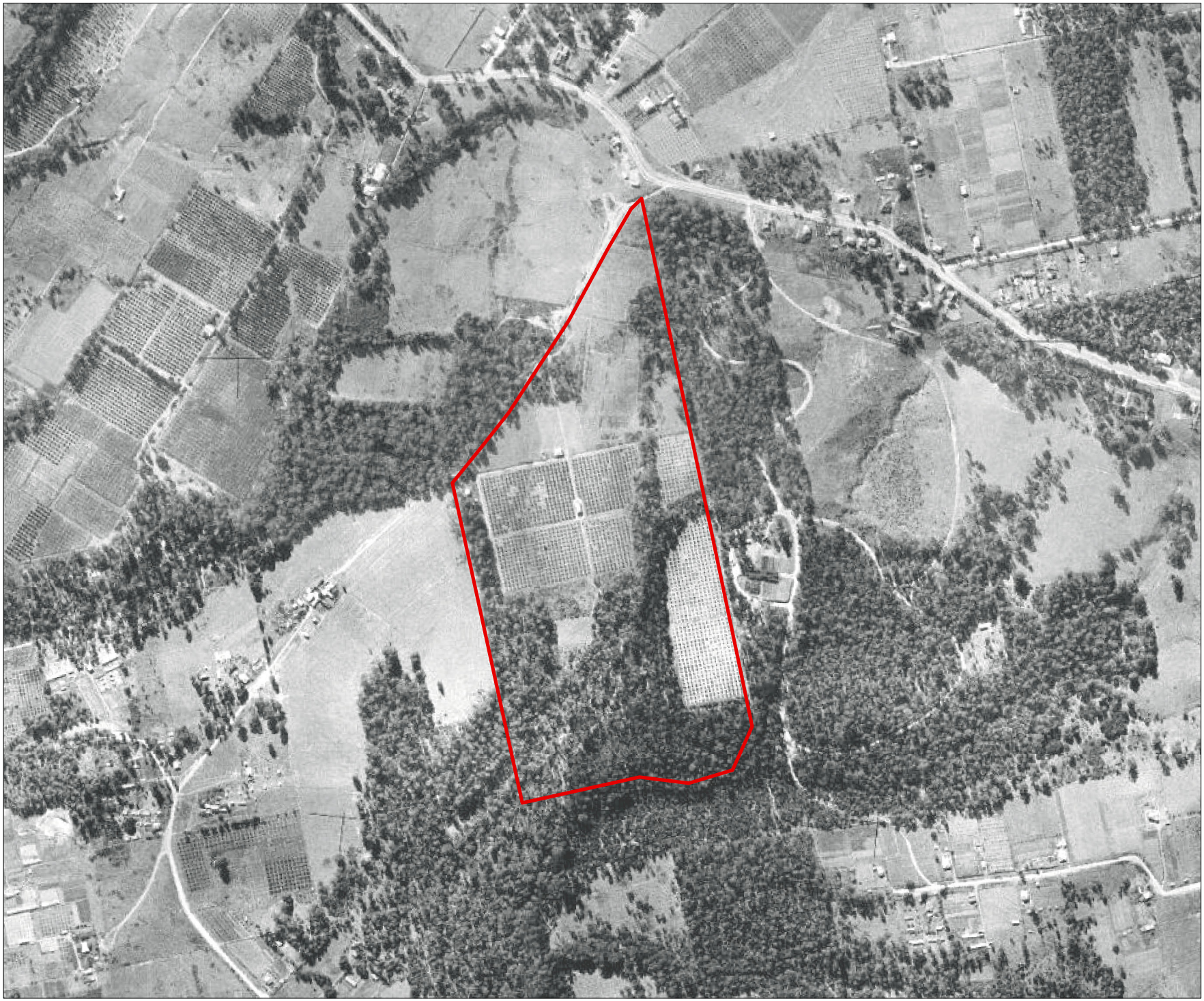
Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1930

FIGURE: 1930

File Name: 54393_1930
Reference: Spatial Services, NSW



Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1943

FIGURE: 1943

File Name: 54393_1943
Reference: Six Maps - https://maps.six.nsw.gov.au

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1951

FIGURE: 1951

File Name: 54393_1951
Reference: Spatial Services, NSW

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1961

FIGURE: 1961

File Name: 54393_1961
Reference: Spatial Services, NSW

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1970

FIGURE: 1970

File Name: 54393_1970
Reference: Spatial Services, NSW

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1986

FIGURE: 1986

File Name: 54393_1986
Reference: Spatial Services, NSW

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 1994

FIGURE: 1994

File Name: 54393_1994
Reference: Spatial Services, NSW

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 2002

FIGURE: 2002

File Name: 54393_2002
Reference: Spatial Services, NSW

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 2009

FIGURE: 2009

File Name: 54393_2009
Reference: Nearmap - www.nearmap.com.au - Imagery 2009

Legend:

Approximate Site Boundary

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev A	Date: 13-Dec-2017
Drawn By: AV	Checked By: JM

Scale 1:8,000

0 90 180

metres

Coor. Sys. GDA 1994 MGA Zone 56

55 Coonara Avenue
West Pennant Hills, NSW
(Lot 61 DP737386)

HISTORICAL AERIAL PHOTOGRAPH - 2017

FIGURE: 2017

File Name: 54393_2017
Reference: Nearmap - www.nearmap.com.au - Imagery 2017

Attachment 5 – NSW EPA Database Records

List of NSW Contaminated Sites Notified to EPA as of 10 November 2017

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
PENNANT HILLS	Shell Coles Express Pennant Hills West	386 Pennant Hills ROAD	Service Station	Contamination currently regulated under CLM Act	-33.73936462	151.0680237
PENRITH	7-Eleven (former Mobil) Service Station	212-222 Andrews ROAD	Service Station	Regulation under CLM Act not required	-33.73059678	150.6952571
PENRITH	7-Eleven Service Station Penrith	30 Henry STREET	Service Station	Regulation under CLM Act not required	-33.75408799	150.7045594
PENRITH	BP Express Service Station	Corner Coreen Avenue and Castlereagh ROAD	Service Station	Regulation under CLM Act not required	-33.74385498	150.6925743
PENRITH	Caltex Penrith Service Station	153 Coreen AVENUE	Service Station	Regulation under CLM Act not required	-33.74287244	150.6927071
PENRITH	Caltex Service Station	Castlereagh Rd Cnr Lugard STREET	Service Station	Regulation under CLM Act not required	-33.73426843	150.6933382
PENRITH	Crane Enfield Metals	Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act	-33.73734959	150.696442
PENRITH	Jet 60 Dry Cleaners	Shop 3 134-138 Henry STREET	Unclassified	Under assessment	-33.75231953	150.6964541
PENRITH	Lowes Petroleum (Former Mobil) Depot Penrith	174 Coreen AVENUE	Other Petroleum	Regulation under CLM Act not required	-33.74484268	150.6980504
PENRITH	Mirvac Industrial Site	2101 Castlereagh ROAD	Other Industry	Regulation under CLM Act not required	-33.73497514	150.6954097
PENSHURST	7-Eleven Service Station	612 Forest ROAD	Service Station	Regulation under CLM Act not required	-33.96153533	151.0793525
PENSHURST	Caltex Service Station	641 King Georges ROAD	Service Station	Regulation under CLM Act not required	-33.95985335	151.0891118
PERISHER VALLEY	Perisher Centre Loading Dock	Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required	-36.40392862	148.4111593
PERISHER VALLEY	Perisher Ski Resort	Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required	-36.41106374	148.4005469
PETERSHAM	Fanny Durack Aquatic Centre	Station STREET	Unclassified	Regulation under CLM Act not required	-33.89194583	151.151824
PHEASANTS NEST	7-Eleven (former Mobil) Service Station	(Northbound) Hume HIGHWAY	Service Station	Regulation under CLM Act not required	-34.28303112	150.6363145
PHEASANTS NEST	7-Eleven Service Station	(Southbound) Hume HIGHWAY	Service Station	Under assessment	-34.28291571	150.6394606
PICTON	Coles Express Picton	93-99 Argyle STREET	Service Station	Regulation under CLM Act not required	-34.16844337	150.6114236
PICTON	McDonalds	69 -71 Argyle STREET	Service Station	Regulation under CLM Act not required	-34.16711877	150.6121524
PLUMPTON	Woolworths Service Station Plumpton (Plumpton Marketplace	260 Jersey ROAD	Service Station	Regulation under CLM Act not required	-33.74478874	150.8369408
PORT BOTANY	Bunnerong Canal	Between Brotherson Dock and Bumborah Point ROAD	Unclassified	Regulation under CLM Act not required	-33.96800557	151.2227633
PORT BOTANY	Port Botany Bus Depot	1 Bumborah Point ROAD	Other Petroleum	Under assessment	-33.96880413	151.2255889
PORT BOTANY	Port Botany Railway Corridors	Friendship ROAD	Other Industry	Regulation under CLM Act not required	-33.95467008	151.2178012
PORT BOTANY	Smith Bros	4 Bumborah Point ROAD	Other Petroleum	Regulation under CLM Act not required	-33.9681757	151.2239505
PORT BOTANY	Sydney Ports Bulk Liquids Berth	Charlotte ROAD	Other Petroleum	Contamination currently regulated under POEO Act	-33.97418047	151.2123791

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
WEST BALLINA	Caltex Big Prawn Service Station	Pacific HIGHWAY	Service Station	Contamination formerly regulated under the CLM Act	-28.86374913	153.5321482
WEST GOSFORD	Caltex Service Station	283 Manns ROAD	Service Station	Regulation under CLM Act not required	-33.41659727	151.325219
WEST GOSFORD	Caltex Service Station	30a Pacific HIGHWAY	Service Station	Regulation under CLM Act not required	-33.42778813	151.3190581
WEST GOSFORD	Caltex Service Station	69-71 Pacific HIGHWAY	Service Station	Under assessment	-33.42729985	151.3214621
WEST NOWRA	Endeavour Energy Nowra Field Service Centre	20 Depot ROAD	Other Industry	Regulation under CLM Act not required	-34.88993085	150.5878854
WEST PENNANT HILLS	7-Eleven (former Mobil) Service Station	552 Pennant Hills ROAD	Service Station	Regulation under CLM Act not required	-33.74686545	151.0508067
WEST RYDE	7-Eleven (former Mobil) Service Station	917 Victoria ROAD	Service Station	Regulation under CLM Act not required	-33.80921103	151.0932917
WEST RYDE	JHM Property Development	2A Mellor Street STREET	Metal Industry	Under assessment	-33.81207534	151.094598
WEST RYDE	Pfizer Australia Pty Ltd	38-42 Wharf ROAD	Chemical Industry	Under assessment	-33.81021085	151.0693631
WEST RYDE	Reckitt Benckiser	44 Wharf ROAD	Chemical Industry	Under assessment	-33.81172205	151.0692752
WEST TAMWORTH	Woolworths Petrol	119 Bridge STREET	Service Station	Regulation under CLM Act not required	-31.09358262	150.9167693
WEST WOLLONGONG	Woolworths Service Station	425 Crown STREET	Service Station	Contamination currently regulated under CLM Act	-34.42637378	150.8799288
WEST WYALONG	Caltex Depot	(Wyalong By-pass Rd) Lot 1-3 Showground ROAD	Service Station	Regulation under CLM Act not required	-33.92556	147.1981659
WEST WYALONG	Former Mobil Depot	104 Compton ROAD	Other Petroleum	Regulation under CLM Act not required	-33.93449194	147.2147948
WEST WYALONG	Lowes Petroleum (Former BP) Depot West Wyalong	Compton (formerly known as Town Bypass/Railway Road) ROAD	Other Petroleum	Regulation under CLM Act not required	-33.93440247	147.2154596
WESTON	Illegal Dumping Site	Corner Kline Street & First STREET	Unclassified	Regulation under CLM Act not required	-32.81367986	151.4551507
WETHERILL PARK	BOC Sydney Operations Centre	428-440 Victoria STREET	Other Industry	Regulation under CLM Act not required	-33.84400237	150.8967556
WETHERILL PARK	Camide Former Landfill	Newton ROAD	Landfill	Regulation under CLM Act not required	-33.83898879	150.8963813
WETHERILL PARK	Cleanaway (Formerly Nationwide Oil) Wetherill Park	6 Davis ROAD	Other Industry	Regulation under CLM Act not required	-33.83770038	150.9045197
WETHERILL PARK	Former Fuel Storage Depot	200-212 Cowpasture ROAD	Other Petroleum	Regulation under CLM Act not required	-33.84568871	150.8764012
WETHERILL PARK	Shell Coles Express Service Station	565 Polding STREET	Service Station	Regulation under CLM Act not required	-33.8569731	150.8992804
WETHERILL PARK	Sims Wetherill Park	35-37 Frank STREET	Metal Industry	Regulation under CLM Act not required	-33.84056122	150.9086265
WICKHAM	Caltex Terminal	156 Hannell STREET	Other Petroleum	Contamination currently regulated under CLM Act	-32.91520778	151.7563638
WICKHAM	Former Factory	57 Annie STREET	Other Industry	Regulation under CLM Act not required	-32.91524827	151.7539893
WICKHAM	Former Warehouse	10 Dangar STREET	Unclassified	Regulation under CLM Act not required	-32.92383206	151.759761
WICKHAM	Former Wool Store Building	33 Annie STREET	Other Petroleum	Under assessment	-32.91585059	151.755215

Attachment 6 – NSW Heritage Records

Office of Environment & Heritage

Search for NSW heritage

Return to search page where you can refine/broaden your search.

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into three sections.

- **Section 1** - contains Aboriginal Places declared by the **Minister for the Environment** under the National Parks and Wildlife Act. This information is provided by the Heritage Division.
- **Section 2** - contains heritage items listed by the **Heritage Council of NSW** under the NSW Heritage Act. This includes listing on the State Heritage Register, an Interim Heritage Order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Division.
- **Section 3** - contains items listed by **local councils** on Local Environmental Plans under the Environmental Planning and Assessment Act, 1979 and **State government agencies** under s.170 of the Heritage Act. This information is provided by local councils and State government agencies.

Section 1. Aboriginal Places listed under the National Parks and Wildlife Act.

Your search did not return any matching results.

Section 2. Items listed under the NSW Heritage Act.

Your search did not return any matching results.

Section 3. Items listed by Local Government and State Agencies.

Your search returned 13 records.

Item name	Address	Suburb	LGA	Information source

Dunrath	139 Castle Hill Road	West Pennant Hills	The Hills	LGOV
Glenhope	113 Castle Hill Road	West Pennant Hills	The Hills	LGOV
Gowan Brae Group		North Parramatta	The Hills	LGOV
Great North Road - b/w West Pennant Hills and Dural	New Line Road	West Pennant Hills and Dural (b/w)	Hornsby	LGOV
House	587 Pennant Hills Road	West Pennant Hills	Hornsby	LGOV
House	37 New Line Road	West Pennant Hills	Hornsby	LGOV
House	75 Victoria Road	West Pennant Hills	Hornsby	LGOV
House	5 Fairburn Avenue	West Pennant Hills	Hornsby	LGOV
House	106 Cardinal Avenue	West Pennant Hills	Hornsby	LGOV
Koala Park Wildlife Sanctuary Grounds	Castle Hill Road	West Pennant Hills	Hornsby	LGOV
Pine Ridge	19 Doris Hirst Place	West Pennant Hills	The Hills	LGOV
Stoneleigh	570 Pennant Hills Road	West Pennant Hills	The Hills	LGOV
Sydney Blue Gum	540 Pennant Hills Road	West Pennant Hills	Hornsby	LGOV

There was a total of 13 records matching your search criteria.

Key:
LGA = Local Government Area

GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.

Note: While the Heritage Division seeks to keep the Inventory up to date, it is reliant on State agencies and local councils to provide their data. Always check with the relevant State agency or local council for the most up-to-date information.

Attachment 7 – Photographic Log

MAIN ENTRANCE TO BUILDING COMPLEX (1)

ASPHALT ROAD WITH PARKING BAYS (1)

LOADING BAY WITH DIESEL UST AND GENERATORS (1)

LOADING BAY WITH WASTE STORAGE (1)

JBS&G

Job No: 54393	
Client: Mirvac Projects Pty Ltd	
Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD
Not to Scale	
Coord. Sys n/a	

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

DIESEL GENERATOR AND DEMOUNTABLES (3)

STORM WATER COLLECTION RESERVOIR (3)

ABOVE GROUND SCEPTIC TANK (3)

GRAVEL PATHWAY EAST OF IBM CARPARK (5)

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev 0 | Date: 8/3/2018

Drawn By: MZ | Checked By: DD

Not to Scale

Coord. Sys n/a

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

PEBBLES SOUTHERN & EASTERN SIDE OF IBM CARPARK (5)

OVERGROWN DAM ALONG EASTERN BOUNDARY FENCE (4)

DAM SOUTH END OF IBM CARPARK (5)

STORM WATER CULVERT NEAR IBM CARPARK (5)

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD

Not to Scale

Coord. Sys n/a

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

DRY GULLEY NEAR IBM CARPARK (5)

STONE RETENTION WALL AND STORM WATER DRAIN (7)

EXPOSED DIRT MOUND AND DECEASED GRASS (7)

WOODEN LOG STOCKPILE ALONG EASTERN BOUNDARY (7)

JBS&G

Job No: 54393	
Client: Mirvac Projects Pty Ltd	
Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD
Not to Scale	
Coord. Sys n/a	

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

STORAGE WASTE MATERIAL ALONG EASTERN BOUNDARY (8)

GRAVEL AND DIRT OVERFLOW CARPARK (8)

GRASSED OVAL WITH BARE DIRT (8)

GRAVEL AND CONCRETE FILL SOUTH EAST OF OVAL (8)

JBS&G

Job No: 54393	
Client: Mirvac Projects Pty Ltd	
Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD
Not to Scale	
Coord. Sys n/a	

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

EXPOSED DIRT AND WASTE MOUND (1)

FILL MATERIAL NORTH WEST OF GRASS OVAL (8)

GRAVEL AND DIRT PATHWAY SOUTH OF GRASS OVAL (8)

WOOD CHIP STOCKPILE NORTHEAST EDGE OF OVAL (8)

JBS&G

Job No: 54393

Client: Mirvac Projects Pty Ltd

Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD

Not to Scale

Coord. Sys n/a

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

ASPHALT ROAD & CAR BAYS SOUTHERN PORTION OF SITE (7)

RIVERBED PEBBLE PATHWAY AND BOULDERS (1)

WATER HOLDING RESERVOIR (9)

EXPOSED DIRT AND GREEN WASTE BIN

JBS&G

Job No: 54393	
Client: Mirvac Projects Pty Ltd	
Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD
Not to Scale	
Coord. Sys n/a	

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

STORM WATER DRAIN AND CONCRETE AND GRAVEL PATH

GARDEN SHED AND WASTE STORAGE (7)

CONCRETE SLABS & WASTE MATERIAL NEAR SUBSTATION

FILL MATERIALS WITHIN OVERFLOW CAR PARK (8)

JBS&G

Job No: 54393	
Client: Mirvac Projects Pty Ltd	
Version: R01 Rev 0	Date: 8/3/2018
Drawn By: MZ	Checked By: DD
Not to Scale	
Coord. Sys n/a	

55 Coonara Avenue, West Pennant Hills, NSW

APPENDIX A

Attachment 8 – Borelogs (JBS&G) – HA01 to HA15

HA01

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 23/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Gravelly silty sand, light brown, dry, well graded, medium sand, rounded, very dense, stiff, heterogeneous. Inclusions of concrete, large gravels, terracotta, plastic, metal, wood chips and fragments and riverbed gravel/pebbles.	HA01 0.0-0.1	No odour, staining or ACM.
						HA01 0.3-0.4	No odour, staining or ACM.
	0.5					HA01 0.5-0.6	No odour, staining or ACM. Refusal at 0.6 mbgs.
		0.60			Borehole HA01 terminated at 0.6m		
	1.0						

HA02

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 22/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.7
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Silty sand, brown, dry, poorly graded, rounded, medium density, firm, heterogeneous. Inclusions of gravels, rootlets, organic matter and plastic.	HA02 0.0-0.1	No odour, staining or ACM.
		0.10		Fill	FILL - Clayey silty sand, light brown, dry, poorly graded, rounded, dense, very stiff, heterogeneous. Inclusions of rootlets and minor gravels.	HA02 0.3-0.4	No odour, staining or ACM.
		0.40		Fill_CLAY	FILL (Potential Reworked Natural) - Clay, dark brown with orange, dry, non-plastic, homogeneous.	HA02 0.5-0.6	No odour, staining or ACM.
	0.5						
		0.70			Borehole HA02 terminated at 0.7m		
	1.0						

HA03

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 23/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Light brown, dry, medium sand, sub-angular, dense, heterogeneous. Inclusions of roots, rootlets, leaves, organic matter, gravel.	HA03 0.0-0.1	No odour, staining or ACM.
						HA03 0.3-0.4	No odour, staining or ACM.
	0.5					HA03 0.5-0.6	No odour, staining or ACM.
		0.60			Borehole HA03 terminated at 0.6m		
	1.0						

HA04

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 22/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Silty sand, brown, dry, well graded, coarse sand, angular, dense, stiff, heterogeneous. Inclusions of organic matter, gravels, plastic, food paper wrapper, roots and rootlets.	HA04 0.0-0.1	No odour, staining or ACM.
		0.30		Fill_CLAY	FILL (Potential Reworked Natural) - Clay, dark brown with orange, dry, non-plastic, homogeneous. Inclusions of rootlets.	HA04 0.3-0.4	No odour, staining or ACM.
	0.5	0.40			Borehole HA04 terminated at 0.4m		
	1.0						

HA05

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 22/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Silty sand, dark brown, dry, coarse sand, angular, medium dense, heterogeneous. Inclusions of leaf litter, plastic, gravel, wood, paper, plastic bottles, roots and rootlets.	HA05 0.0-0.1	No odour, staining or ACM.
		0.30		Fill	FILL - Clayey silty sand, light brown, dry, coarse sand, angular, medium density, heterogeneous. Inclusions of gravel, roots and rootlets.	HA05 0.3-0.4	No odour, staining or ACM. Refusal at 0.4 mbgs.
		0.40			Borehole HA05 terminated at 0.4m		
	0.5						
	1.0						

HA06

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 22/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.7
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Clayey sand, dark brown, dry, poorly graded, fine sand, rounded, very dense. Change of colour to light brown at 0.4 mbgs. Inclusions of gravel, organic matter, roots, rootlets clay fragments.	HA06 0.0-0.1	No odour, staining or ACM. QA/QC2202
						HA06 0.3-0.4	No odour, staining or ACM.
	0.5					HA06 0.5-0.6	No odour, staining or ACM.
		0.70			Borehole HA06 terminated at 0.7m		
	1.0						

BOREHOLE JBSG BOREHOLE - 2017.GPJ GINT STD AUSTRALIA.GDT 13/3/18

HA07

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 23/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Silty sand, brown, dry, coarse sand, angular, dense, heterogeneous. Inclusions of leaf litter, large gravel, brick, sandstone, roots and rootlets.	HA07 0.0-0.1	No odour, staining or ACM.
		0.10		Fill	FILL - Sand, orange, dry, very dense, coarse, angular, wellgraded, homogeneous. Slight change of colour to pink/orange at 0.5 mbgs. Inclusions of roots, rootlets, sandstone and large gravels.		
						HA07 0.3-0.4	No odour, staining or ACM.
	0.5					HA07 0.5-0.6	No staining or ACM. Slight organic anerobic odour.
		0.60			Borehole HA07 terminated at 0.6m		
	1.0						

HA08

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 22/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Clayey sand, brown, dry, poorly graded, fine sand, rounded, very dense, heterogeneous. Inclusions of gravel, roots, rootlets, concrete, brick and plastic.	HA08 0.0-0.1	No odour, staining or ACM.
						HA08 0.3-0.4	No odour, staining or ACM.
	0.5					HA08 0.5-0.6	No odour, staining or ACM.
		0.60			Borehole HA08 terminated at 0.6m		
	1.0						

HA09

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 23/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Gravelly silty sand, light brown, dry, loose, very soft, rounded. Inclusions of wood chips, roots, rootlets, organic matter, gravel and plastic.	HA09 0.0-0.1	No odour, staining or ACM.
						HA09 0.3-0.4	No odour, staining or ACM. QA/QC2302
	0.5					HA09 0.4-0.5	No odour, staining or ACM. Refusal at 0.5 mbgs.
		0.50			Borehole HA09 terminated at 0.5m		
	1.0						

HA10

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 23/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Sandy silt, brown, dry, poorly graded, angular, dense, heterogeneous. Inclusions of roots, rootlets, brick, concrete, gravel and plastic.	HA10 0.0-0.1	No odour, staining or ACM.
						HA10 0.3-0.4	No odour, staining or ACM.
	0.5					HA10 0.5-0.6	No odour, staining or ACM. Refusal at 0.6 mbgs.
		0.60			Borehole HA10 terminated at 0.6m		
	1.0						

HA11

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 23/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Silty sand, light brown, dry, well graded, medium sand, sub-rounded, heterogeneous. Inclusions of organic matter, leaf litter, twigs and large angular gravel.	HA11 0.0-0.1	No odour, staining or ACM. Slight green tinge.
		0.10		Fill	FILL (Potential Reworked Natural) - Clay, orange to brown, dry, non-plastic, dense, very stiff, homogeneous.		
						HA11 0.3-0.4	No odour, staining or ACM.
		0.40			Borehole HA11 terminated at 0.4m		
	0.5						
	1.0						

HA12

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 21/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Clayey silt, light brown, dry, dense, stiff, poorly graded, heterogeneous. Inclusions of gravels, brick, organic matter and roots.	HA12 0.0-0.1	No odour, staining or ACM.
		0.10		Fill	FILL (Potential Reworked Natural) - Clay, light brown, dry, non-plastic, homogeneous. Inclusions of clay chunks, rootlets, deceased organic matter, gravels.	HA12 0.3-0.4	No odour, staining or ACM.
		0.40		Fill	FILL (Potential Reworked Natural) - Clay, light brown, dry, non-plastic, homogeneous.	HA12 0.5-0.6	No odour, staining or ACM.
	0.5						
		0.60			Borehole HA12 terminated at 0.6m		
	1.0						

HA13

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 21/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.8
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				PT	FILL - PEAT	HA13 0.0-0.1	No odour, staining or ACM.
		0.10		Fill	FILL - Gravelly clay, light brown, dry, non-plastic, angular medium gravels, heterogeneous. Inclusions of minor gravels, brick, plastic mesh, clay chunks and sandstone.	HA13 0.3-0.4	No odour, staining or ACM.
	0.5					HA13 0.5-0.6	No odour, staining or ACM.
		0.60		Fill	FILL (Potential Reworked Natural) - Clay, light brown, dry, non-plastic, heterogeneous.	HA13 0.7-0.8	No odour, staining or ACM.
		0.80			Borehole HA13 terminated at 0.8m		
	1.0						

HA14

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 21/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.7
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				PT	FILL - PEAT	HA14 0.0-0.1	No odour, staining or ACM.
		0.10		Fill	FILL - Silty sand, light brown, dry, fine sand, poorly graded, very dense, hard, heterogeneous. Inclusions of rootlets and minor gravels.		
						HA14 0.3-0.4	No odour, staining or ACM.
	0.5					HA14 0.5-0.6	No odour, staining or ACM.
		0.60					
					Borehole HA14 terminated at 0.7m		
	1.0						

HA15

Project Number: 54393
Client: Mirvac Projects Pty Ltd
Project Name: West Pennant Hills DD
Site Address: 55 Coonara Avenue

Date: 21/02/2018
Logged By: MZ
Contractor:
Total Hole Depth (mbgs): 0.7
Bore Diameter (mm): 90

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA				Fill	FILL - Silty sand, light brown to brown, dry, poorly graded, fine sand, dense, stiff, heterogeneous. Inclusions of deceased organic matter, minor gravels, leaf litter, rootlets.	HA15 0.0-0.1	No odour, staining or ACM.
		0.10		Fill	FILL - Clayey silty sand, brown, dry, poorly graded, dense, stiff, heterogeneous. Inclusions of roots and rootlets.		
						HA15 0.3-0.4	No odour, staining or ACM.
	0.5						
		0.50		Fill	FILL (Potential Reworked Natural) - Clay, brown to orange, dry, non-plastic, homogeneous.	HA15 0.5-0.6	No odour, staining or ACM.
		0.70			Borehole HA15 terminated at 0.7m		
	1.0						

Attachment 9 – QAQC Assessment

Attachment 10 – PB Borelogs

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 118.222 AHD **BORE No:** 1
EASTING: 317882.3 **PROJECT No:** 86072.01
NORTHING: 6264327.319 **DATE:** 19/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
118	0.1	ROADBASE - 10-20mm igneous gravel with some sand		A	0.1				Gatic cover
		SILTY CLAY - apparently very stiff, red-brown silty clay with some fine to medium ironstone gravel, damp		A	0.5				Backfill 0.0-1.0m
	0.7	SANDY CLAY - hard, red-brown, orange and grey, sandy (fine to medium) clay with some fine to medium ironstone gravel, damp		A	1.0				Blank pipe 0.0-2.2m
117	1			S			9,15,27 N = 42		Bentonite 1.0-1.5m
	1.5	SANDSTONE - medium strength, moderately weathered, slightly fractured, brown, fine to medium grained sandstone			1.45 1.5 1.7		PL(A) = 0.77		
116	2			C					
	2.05	SANDSTONE - extremely low to very low then medium strength, highly weathered, fractured, light grey-brown, fine to medium grained sandstone			2.8		PL(A) = 0.81		
	3 3.0	SANDSTONE - high strength, moderately to slightly weathered, light grey and brown, fine to medium grained sandstone with some thin clay seams			3.0				Gravel 1.5-5.2m
115					3.6		PL(A) = 1.58		Machine slotted PVC screen 2.2-5.2m
	4			C					
114					4.35		PL(A) = 1.3		
	5								
	5.2				5.1		PL(A) = 1.53		End cap
113		Bore discontinued at 5.2m			5.2				
112	6								
111	7								
110	8								
109	9								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 1.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Washboring (water) to 1.5m; NMLC-Coring to 5.2m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 4.2m (blank 0.0-2.2m; screen 2.2-5.2m; backfill 0.0-1.0m; bentonite 1.0-1.5m; gravel 1.5-5.0m; gatic at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 122.673 AHD
EASTING: 317858.39
NORTHING: 6264407.632
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 86072.01
DATE: 16/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
122	0.05	ASPHALTIC CONCRETE		A	0.1		0.2-1.0m: Bulk sample		
	0.2	ROADBASE - 5-10mm igneous gravel with some sand			0.2				
		FILLING - apparently moderately compacted, brown, silty clay filling with some fine to coarse sandstone gravel, humid		A	0.5				
	0.8								
	1	SILTY CLAY - very stiff, red-brown silty clay with some fine to medium ironstone gravel, damp		A	1.0				
				S			7,11,16 N = 27		
	1.5				1.45				
121		SANDSTONE - medium then high strength, highly to moderately weathered, fragmented to fractured and slightly fractured, light grey-brown, fine grained sandstone with some very low strength bands			1.5				
	2			C	1.95		PL(A) = 0.43		
					2.2		PL(A) = 0.98		
120									
	3				2.8				
119					3.6		PL(A) = 1.49		
				C					
	3.91								
	4	LAMINITE - medium then high strength, slightly weathered, fractured and slightly fractured, grey-brown laminite with approximately 40% siltstone laminations			4.15		PL(A) = 0.51		
118									
	4.77				4.7		PL(A) = 1.89		
		Bore discontinued at 4.77m			4.77				
	5								
117									
	6								
116									
	7								
115									
	8								
114									
	9								
113									

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 1.2m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Washboring (water) to 1.5m; NMLC-Coring to 4.75m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 126.808 AHD
EASTING: 317851.316
NORTHING: 6264468.429
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 86072.01
DATE: 21/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
126	0.05	ASPHALTIC CONCRETE		A	0.1				
	0.15								
	0.2	ROADBASE - 10-20mm igneous gravel, cement stabilised		A	0.5				
		FILLING - apparently moderately compacted, brown, silty fine to coarse sand filling, damp							
	1	SILTY CLAY - very stiff, red-brown, silty clay with some fine to medium ironstone gravel, moist		A	1.0				
		1.0m: becoming mottled grey, orange and brown		S			8,10,16 N = 26		
					1.45				
	1.6				1.6				
125	1.75	SHALE - extremely low strength, extremely to highly weathered, fractured, grey and orange shale with some low to medium strength iron-cemented bands		C					
	2								
					2.6				
124	3			C					
	3.31				3.35		PL(A) = 1.5		
		SANDSTONE - extremely low to very low strength, extremely to highly weathered, fractured, grey and brown, fine to medium grained sandstone with some high strength iron-cemented bands			3.5				
123	3.9								
	4	SANDSTONE - high strength, moderately weathered then fresh, slightly fractured, brown and pale grey, fine to medium grained sandstone with some carbonaceous laminations			4.0		PL(A) = 1.5		
				C					
122	5				4.9		PL(A) = 2.8		
	5.6				5.55		PL(A) = 2.1		
		Bore discontinued at 5.6m - target depth reached			5.6				
121	6								
120	7								
119	8								
118	9								
117									

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 1.2m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m;l Washboring (water) to 1.6m; NMLC-Coring to 5.6m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 128.421 AHD **BORE No:** 4
EASTING: 317870.583 **PROJECT No:** 86072.01
NORTHING: 6264516.093 **DATE:** 12 - 13/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
128	0.05	ASPHALTIC CONCRETE							Gatic cover
	0.2	ROADBASE - 20mm igneous gravel		A	0.2				Backfill 0.0-0.5m
		FILLING - apparently well compacted, light brown, gravelly (fine to coarse sandstone), fine to coarse sand filling with some clay, humid		A	0.3 0.4 0.5				Blank pipe 0.0-2.1m
	0.9				0.9				
1		SILTY CLAY - very stiff, red-brown, silty clay with some fine to medium ironstone gravel and rootlets, damp		A	1.0				Bentonite 0.5-1.5m
127				S	1.45		7,10,14 N = 24		
2		2.2m: becoming hard with some ironstone bands							
126	2.55			S	2.5 2.51 2.55 2.8		8/10mm refusal bouncing PL(A) = 1.9		
3		SANDSTONE - high strength, highly to moderately then moderately weathered, fractured to slightly fractured, brown and grey, fine to medium grained sandstone with some extremely low and very low strength bands							Gravel 1.5-5.1m
125					3.45		PL(A) = 1.32		
4				C					Machine slotted PVC screen 2.1-5.1m
124					4.75		PL(A) = 1.37		
5	5.15				5.15				End cap
123		Bore discontinued at 5.15m - target depth reached							
6									
122									
7									
121									
8									
120									
9									
119									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** MB/JB/SI **CASING:** HQ to 2.5m; HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; NMLC-Coring to 5.15m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 5.1m (screen 5.1-2.1m; blank 2.1-0.0; gravel 5.1-1.5m; bentonite 1.5-0.5m; backfill to GL)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 130.829 AHD **BORE No:** 5
EASTING: 317915.544 **PROJECT No:** 86072.01
NORTHING: 6264573.855 **DATE:** 12/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
130	0.03	ASPHALTIC CONCRETE							
	0.15	ROADBASE - 20-30mm igneous gravel		A	0.15				
		FILLING - variably compacted, brown and light brown, gravelly (fine to coarse sandstone), fine to coarse sand filling with some clay and possibly sandstone boulders, humid		A	0.2 0.4				
	1			A	0.5 0.9				1
				S	1.0 1.15		27/150mm refusal		
129	1.7	SILTY CLAY - apparently very stiff, mottled brown and grey silty clay with some fine to medium ironstone gravel, damp							
	2								2
	2.5	SANDSTONE - extremely low strength, extremely weathered, light grey-brown, fine grained sandstone		S	2.5		9,17,18/100mm refusal		
128	3				2.9 3.0				3
	3.2	SANDSTONE - medium strength, highly weathered, fractured, pale grey and brown, fine to medium grained sandstone with some extremely low strength bands			3.69		PL(A) = 0.5		
127	3.85	SANDSTONE - high strength, moderately weathered, slightly fractured, light brown and grey, fine to medium grained sandstone		C					
	4				4.27		PL(A) = 1.3		4
126	5								5
	5.1	4.92-5.03m: clay seam			5.0		PL(A) = 1.5		
		Bore discontinued at 5.1m - target depth reached			5.1				
125	6								6
124	7								7
123	8								8
122	9								9
121									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** MB/JB/SI **CASING:** HW to 3.0m; HQ to3.0m
TYPE OF BORING: Solid flight auger (TC-bit) to 3.0m; NMLC-Coring to 5.1m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 135.298 AHD **BORE No:** 6
EASTING: 317932.225 **PROJECT No:** 86072.01
NORTHING: 6264632.902 **DATE:** 14/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
135	0.03	ASPHALTIC CONCRETE		A	0.1		0.2-1.0m: Bulk sample		
	0.2	ROADBASE - igneous gravel, 20mm			0.2				
		FILLING - apparently moderately compacted, red-brown, gravelly (fine to medium shale), silty clay filling with some sand (fine to coarse), damp		A	0.5				
	1			A	1.0				1
	1.1	SILTY CLAY - hard, mottled grey and red silty clay		S			12,18,24 N = 42		
134					1.45				
	2								2
	2.1	SHALE - extremely low strength, grey shale							
133				S	2.5		25/110mm refusal		
	2.7				2.61				
		SHALE - extremely low then very low strength, highly weathered, slightly fractured and fractured, grey and dark brown-grey shale with some medium strength iron-cemented bands			2.7				
	3			C					3
132					3.1				
	4								4
131				C					
	5								5
	5.0	SANDSTONE - low then low to medium strength, moderately weathered, fractured and slightly fractured, light grey-brown, fine to medium grained sandstone			5.05		PL(A) = 0.24		
130					5.2				
		5.4m: clay seam, 80mm			5.6		PL(A) = 0.86		
	6								6
129	6.45	SANDSTONE - high strength, slightly weathered, slightly fractured, light grey-brown, fine to medium grained sandstone		C	6.55		PL(A) = 1.48		
	7								7
128		7.72-7.85m: siltstone band			7.8		PL(A) = 1.72		
	8	8.0m: becoming very high strength			8.0		PL(A) = 3.06		8
127	8.2	Bore discontinued at 8.2m			8.2				
	9								9
126									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** MB/JB/SI **CASING:** HQ to 2.5m; HW to 2.5m
TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary (washboring) to 2.7m; NMLC-Coring to9 8.2m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 139.663 AHD
EASTING: 317955.122
NORTHING: 6264666.388
DIP/AZIMUTH: 90°/--

BORE No: 7
PROJECT No: 86072.01
DATE: 20/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
139	0.04	ASPHALTIC CONCRETE		A	0.1				Gatic cover
	0.3	ROADBASE - 10-20mm igneous gravel with some sand							
		SILTY CLAY - apparently very stiff, brown silty clay with some fine to medium ironstone gravel and charcoal, damp		A	0.5				Backfill 0.0-1.0m
		0.8m: becoming hard and grey mottled brown		A	1.0		18,25/80mm refusal		
138	1.3			S	1.3				Bentonite 1.0-1.5m
	1.47	SHALE - extremely low strength, extrtemely and highly weathered, light grey-brown shale			1.45				
	1.75	SHALE - low to medium strength extremely to highly weathered with some moderately weathered bands, fractured, dark grey and brown shale		C	1.85		PL(A) = 0.9		
137	2.9				2.85		PL(A) = 0.9		Gravel 1.5-5.2m
		SHALE - medium strength with some high and low strength bands, moderately to slightly weathered, fractured to slightly fractured, grey grey shale with some brown shale			2.9				
					3.1		PL(A) = 1.3		
136					3.7		PL(A) = 0.9		Machine slotted PVC screen 2.2-5.2m
				C					
135					4.4		PL(A) = 0.3		
	5.2	Bore discontinued at 5.2m - target depth reached			5.2				End cap
134									
133									
132									
131									
130									

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 1.2m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Washboring (water) to 1.3m; NMLC-Coring to 5.2m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 5.2m (blank 0.0-2.2m; screen 2.2-5.2m; backfill 0.0-1.0m; bentonite 1.0-1.5m; gravel 1.5-5.2m; gatic at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 146.746 AHD **BORE No:** 8
EASTING: 317997.56 **PROJECT No:** 86072.01
NORTHING: 6264742.156 **DATE:** 20 - 23/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
146	0.05	ASPHALTIC CONCRETE		A	0.1				
	0.2								
	0.3	ROADBASE - 10-20mm igneous gravel with some sand		A	0.5				
		FILLING - apparently moderately compacted, brown silty clay filling with some fine to medium sandstone gravel, humid							
145	1	SILTY CLAY - very stiff to hard, mottled brown and grey, silty clay with some fine to medium ironstone gravel, moist		A	1.0				
		0.9m: becoming hard and grey mottled orange		S			10,16,22 N = 38		
					1.45				
	1.6	SHALE - extremely low to very low strength with some high strength ironstone bands, extremely and highly weathered, slightly fractured, mottled grey and red-brown shale			1.6				
144	2			C	2.55		PL(A) = 0.5		
	2.54	SHALE - medium strength, slightly weathered, fractured, dark grey shale			2.8		PL(A) = 0.4		
	3				3.25		PL(A) = 0.8		
143					3.3				
	3.9	LAMINITE - high strength, slightly weathered then fresh, slightly fractured, laminite consisting of interbedded dark grey shale (80%) and pale grey, fine grained sandstone (20%)			3.95		PL(A) = 2.6		
142	4			C	4.55		PL(A) = 2		
	5				4.8		PL(A) = 1.9		
141					5.55		PL(A) = 2.2		
	5.7	Bore discontinued at 5.7m - target depth reached			5.7				
140	6								
139	7								
138	8								
137	9								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB/SI **CASING:** HW to 1.2m
TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Washboring (water) to 1.6m; NMLC-Coring to 5.65m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 149.848 AHD **BORE No:** 9
EASTING: 318030.452 **PROJECT No:** 86072.01
NORTHING: 6264780.514 **DATE:** 16 - 19/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
149	0.04	ASPHALTIC CONCRETE		A	0.1				
	0.1	ROADBASE - 10-20mm igneous gravel with some sand							
	0.5	FILLING - apparently moderately compacted, brown, silty clay filling with some sand and fine to medium sandstone gravel, humid		A	0.5				
				B					
	1	SILTY CLAY - hard, mottled brown and grey, silty clay with some fine to medium ironstone gravel		A	1.0				
				S			8,13,21 N = 34		
148					1.45				
	2				2.5				
	2.7	SHALE - extremely low strength, dark brown-grey shale		S			15,21,30/130mm refusal		
147					2.83				
	3				3.0				
	3.0	SHALE - extremely low and very low strength, extremely and highly weathered, fractured and slightly fractured, brown and grey shale with traces of ironstone bands			3.33		pp = 420		
					3.45		pp = 150		
146				C	3.8		PL(A) = 0.1		
	4				4.2		pp = 300		
					4.35		PL(A) = 0.9		
					4.4				
145	4.92	SHALE - medium then medium to high strength, moderately then slightly weathered, slightly fractured, grey-brown shale			4.95		PL(A) = 0.4		
	5			C					
		5.6-6.0m: low strength band			5.75		PL(A) = 0.2		
144	6								
	6.3	Bore discontinued at 6.3m - target depth reached			6.25		PL(A) = 1		
					6.3				
143	7								
142	8								
141	9								
140									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** MB/SI **CASING:** HW to 2.5m; HQ to 3.0m
TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Washboring (water) to 3.0m; NMLC-Coring to 6.3m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 153.441 AHD
EASTING: 318053.836
NORTHING: 6264824.159
DIP/AZIMUTH: 90°/--

BORE No: 10
PROJECT No: 86072.01
DATE: 16/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
153.44	0.03	ASPHALTIC CONCRETE							Gatic cover
153.34	0.1								
153.24	0.2	ROADBASE - 20mm igneous gravel		A	0.2				
		FILLING - apparently moderately compacted, brown, silty clay filling with some fine to medium sandstone gravel, damp		A	0.5				
152.44	1	SILTY CLAY - very stiff, brown, silty clay with some fine to medium ironstone gravel, moist		A	1.0		8,14,19 N = 33		Backfill 0.0-2.0m
		1.0m: becoming hard and grey mottled brown		S	1.45				
151.44	2								Bentonite 2.0-2.5m
				S	2.5		14,25/130mm refusal		
					2.78				
150.44	3	3.0 CLAY - stiff, light grey-brown clay with some ironcemented bands			3.0				
					3.25		pp = 150		
				C					
149.44	4								Gravel 2.5-6.0m
		4.5 SHALE - very low then very low to low strength, highly weathered, grey-brown shale with some low strength bands			4.5				Machine slotted PVC screen 2.5-6.0m
				C	4.9				
148.44	5								
		5.5 SHALE - low strength, slightly weathered, slightly fractured, grey to grey-brown shale		C	5.55		PL(A) = 0.15		
					5.8				
147.44	6								
					6.5		PL(A) = 0.22		
		6.73 LAMINITE - high strength, fresh, slightly fractured, light grey to grey laminite with approximately 30% fine sandstone laminations		C					Backfill 6.0-7.8m
146.44	7				7.55		PL(A) = 2.26		
146.04	7.8	Bore discontinued at 7.8m			7.8				
145.44	8								
144.44	9								

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** MB/SI **CASING:** HW to 3.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 3.0m; NMLC-Coring to 7.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 7.8m (blank 0.0-0.3m; screen 3.0-6.0m; backfill 0.0-0.2m; bentonite 2.0-2.5m; gravel 2.5-6.0m; backfill 6.0-7.8m; gatic at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 317955.087
NORTHING: 6264322.391
DIP/AZIMUTH: 90°/--

BORE No: 11
PROJECT No: 86072.01
DATE: 15 - 21/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALTIC CONCRETE		A	0.1		0.2-1.0m: Bulk sample		
	0.2	ROADBASE - 10-20mm igneous gravel with some sand			0.2				
		FILLING - variably compacted, brown, sandy (fine to coarse) clay filling with some fine to coarse sandstone gravel, damp		A	0.5				
	1			A	1.0				
				S			11,16,16 N = 32		
					1.45				
	2				2.5				
				S			5,8,13 N = 21		
	3				2.95				
	3.3	SILTY CLAY - stiff, red-brown and grey, silty clay with some fine ironstone gravel and charcoal, moist							
	4				4.0				
				S			3,5,6 N = 11		
					4.45				
	4.7				4.7				
	4.85	SANDSTONE - extremely low strength, extremely to highly weathered, slightly fractured, red and grey, fine to medium grained sandstone with some medium strength, iron rich bands							
	5								
	5.83	SANDSTONE - low then medium to high strength, moderately to slightly weathered, slightly fractured, pale grey and brown, medium grained sandstone		C	5.9		PL(A) = 0.2		
	6				6.0		PL(A) = 0.2		
					6.55		PL(A) = 1.3		
	7				7.0		PL(A) = 1		
	7.2	Bore discontinued at 7.2m - target depth reached			7.2				
	8								
	9								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB/SI **CASING:** HW to 4.3m
TYPE OF BORING: Solid flight auger (TC-bit) to 4.3m; Washboring (water) to 4.7m; NMLC-Coring to 7.2m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 119.409 AHD **BORE No:** 12
EASTING: 317905.103 **PROJECT No:** 86072.01
NORTHING: 6264444.381 **DATE:** 19/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
119	0.08	ASPHALTIC CONCRETE		A	0.1				
	0.2	ROADBASE - 10-20mm igneous gravel with some fine to coarse sand, hydrocarbon odour		A	0.2 0.4 0.5				
	0.8	FILLING - apparently moderately compacted, brown, gravelly (fine to coarse sandstone), fine to coarse sand filling with some clay, damp		A	0.9 1.0				
118	1	FILLING - variably compacted, brown, gravelly (fine to coarse sandstone), clay filling with some sand, damp		S			3,4,4 N = 8		
					1.45				
117	2	2.2m: some timber fragments		A	1.9 2.0				
					2.5				
	2.8	SANDY CLAY - very stiff, grey mottled orange, sandy (fine to medium) clay with some fine to medium ironstone gravel, damp		S			2,7,12 N = 19		
116	3				2.95				
	3.1				3.1				
	3.45	SANDSTONE - extremely low then very low strength, extremely and highly weathered, light grey-brown, fine grained sandstone							
	3.85	SANDSTONE - high strength, highly to moderately weathered, fractured and slightly fractured, light grey-brown, fine to medium grained sandstone with some very low strength bands		C	4.1		PL(A) = 2.03		
115	4								
	4.7	SANDSTONE - high then medium strength, moderately then slightly weathered, slightly fractured, brown and light grey, fine to medium grained sandstone with some clay seams			4.95				
114	5								
					5.6		PL(A) = 1.26		
	6			C					
113					6.25		PL(A) = 0.77		
	6.95	Bore discontinued at 6.95m			6.95				
112	7								
111	8								
110	9								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.7m
TYPE OF BORING: Solid flight auger (T-bit) to 2.5m; Rotary to 3.0m; NMLC-Coring to 6.95m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 125.299 AHD **BORE No:** 13
EASTING: 317928.645 **PROJECT No:** 86072.01
NORTHING: 6264485.926 **DATE:** 13/12/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
125	0.04	BRICK PAVERS							
	0.24	CONCRETE							
		FILLING - apparently moderately compacted, brown gravelly (fine to coarse sandstone and ironstone), fine to coarse sand filling with some clay, humid		A	0.5				
	1			A	1.0				1
124	1.3	FILLING - variably compacted, brown and grey, sandy (fine to coarse) clay filling with some fine to coarse sandstone gravel and sandstone boulders, humid		S	1.45		13,10,17 N = 27		
	2								2
123				S	2.5 2.64		30/140mm refusal		
					2.7				
	3			C					3
122									
	4				4.1		4.1-5.1m: Rotary		4
121				S			9,13,16 N = 29		
					4.55				
	4.8	SILTY CLAY - very stiff then hard, orange-brown silty clay with some fine sand and fine to coarse ironstone gravel							
	5				5.1				5
120					5.6		pp = 550		
					5.7		pp = 300		
					5.8		pp = 500		
	6				5.95		pp = 400		6
				C	6.05		pp = 550		
119	6.2	SANDSTONE - extremely low strength, extremely weathered, pale grey, fine to medium grained sandstone			6.2		pp >600		
					6.3		pp >600		
	6.63	SANDSTONE - low then high strength, moderately weathered, slightly fractured, pale grey, orange and red, fine to medium grained sandstone			6.5		pp >600		
	7				7.0		PL(A) = 1.94		7
118	7.25	Bore discontinued at 7.25m			7.25				
	8								8
117									
	9								9
116									

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.7m; NMLC-Coring to 4.1m; Washbore (water) to 5.1m; NMLC-Coring to 7.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 126.733 AHD **BORE No:** 14
EASTING: 317948.142 **PROJECT No:** 86072.01
NORTHING: 6264514.964 **DATE:** 13/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
126	0.03	ASPHALTIC CONCRETE							
	0.2	ROADBASE - 20mm igneous gravel		A	0.2				
	0.4	FILLING - apparently moderately compacted, light brown, gravelly (fine to coarse sandstone) fine to coarse sand filling, humid			0.3				
				D					
				A	0.9				
125	1	FILLING - variably compacted, brown silty clay filling with some fine to medium laminite gravel, sand and rootlets, humid		S	1.0		14,30/140mm refusal bouncing		
					1.29				
					1.7				
124	2			C					
	2.13	SANDSTONE - extremely low then very low strength, extremely to highly weathered, brown and grey, fine to medium grained sandstone with some medium and high to very high strength bands			2.7				
					2.8		PL(A) = 0.15		
123	3								
				C	3.9		PL(A) = 2.28		
122	4								
	4.48				4.4		PL(A) = 3.25		
	4.58	4.4m: very high strength iron-cemented band							
	5				5.0				
121					5.6		PL(A) = 0.11		
	5.89	SANDSTONE - medium then high strength, moderately weathered, fractured to slightly fractured, brown, fine to medium grained sandstone with some siltstone laminations and some clay bands							
120	6			C					
					6.6		PL(A) = 0.9		
	7								
119									
	7.95				7.9		PL(A) = 1.29		
118	8	Bore discontinued at 7.95m - target depth reached			7.95				
	9								
117									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JB/MB/SI **CASING:** HQ/HW to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary (washboring) to 1.7m; NMLC-Coring to 7.95m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 128.986 AHD
EASTING: 317955.646
NORTHING: 6264558.013
DIP/AZIMUTH: 90°/--

BORE No: 15
PROJECT No: 86072.01
DATE: 14/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
128	0.05	ASPHALTIC CONCRETE		A	0.1				
	0.2	ROADBASE - 20mm igneous gravel		A	0.5				
		FILLING - apparently moderately compacted, brown, sandy (fine to coarse) clay filling with some fine to coarse sandstone gravel, damp		A	1.0				
	1.1	SANDSTONE - extremely low strength, extremely weathered, grey and orange, fine to medium grained sandstone		S	1.45		12,20,21 N = 41		
					1.5				
	1.75	SANDSTONE - medium and high strength, moderately weathered, fractured and slightly fractured, brown and grey, fine to medium grained sandstone with some very low strength bands			1.75		PL(A) = 1.2		
127				C					
					2.57		PL(A) = 1.5		
126					3.2				
					3.66		PL(A) = 0.8		
125				C	4.36		PL(A) = 1.4		
124					5.43		PL(A) = 2.4		
	5.5	Bore discontinued at 5.5m - target depth reached			5.5				
123									
122									
121									
120									

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.5m; NMLC-Coring to 5.5m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 129.903 AHD
EASTING: 317998.901
NORTHING: 6264596.807
DIP/AZIMUTH: 90°/--

BORE No: 16
PROJECT No: 86072.01
DATE: 15/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
129	0.04	ASPHALTIC CONCRETE		A	0.1				
	0.15	ROADBASE - igneous gravel, 20mm		A	0.2				
	0.6	FILLING - apparently moderately compacted, brown gravelly (fine to coarse sandstone) clay filling with some sand and silt and rootlets, humid		A	0.5				
	1.0	SANDSTONE - very low to low strength, grey-brown, fine to medium grained sandstone			1.0				
128		SANDSTONE - high strength, fresh, slightly fractured and unbroken, pale grey fine to medium grained sandstone with some carbonaceous laminations		C	1.9		PL(A) = 1.55		
					2.5				
127	3.1				2.95		PL(A) = 1.53		
		INTERBEDDED SANDSTONE & SILTSTONE - high strength, fresh, unbroken, light grey, fine to medium grained sandstone (60%) interbedded with grey siltstone (40%)		C					
126					3.9		PL(A) = 1.87		
125					4.88		PL(A) = 1.88		
	5.0	Bore discontinued at 5.0m - target depth reached			5.0				
124									
123									
122									
121									
120									

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JB/MB/SI **CASING:** HQ to 1.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; NMLC-Coring to 5.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 134.146 AHD **BORE No:** 17
EASTING: 318019.948 **PROJECT No:** 86072.01
NORTHING: 6264643.912 **DATE:** 22 - 23/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
134	0.05	ASPHALTIC CONCRETE		A	0.1		0.2-1.0m: Bulk sample		
	0.2	ROADBASE - 10-20mm igneous gravel with some sand			0.2				
		SILTY CLAY - very stiff, brown silty clay with some fine to medium ironstone gravel, damp		A	0.5				
133	1	0.9m: becoming grey mottled orange		A	1.0				
				S			8,11,19 N = 30		
					1.45				
	1.6	SHALE - extremely low to very low strength with some medium strength iron-cemented bands, extremely to highly weathered, fractured to slightly fractured, mottled grey and red-brown shale			1.6				
132	2			C					
	1.95				2.9				
131	3								
	3.21				3.55		pp = 550		
					3.85		pp = 440		
130	4			C					
	4.51	SANDSTONE - medium strength with some extremely low to very low strength bands, moderately to highly weathered, fractured, grey and brown, fine grained sandstone							
	4.93				5.0		PL(A) = 1.4		
129	5	SANDSTONE - high strength, slightly weathered then fresh, slightly fractured, unbroken, light brown then grey, fine grained sandstone			5.1		PL(A) = 2.1		
				C					
	6.0	Bore discontinued at 6.0m - target depth reached			5.95 6.0		PL(A) = 2.1		
128	6								
127	7								
126	8								
125	9								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** JB/MB/SI **CASING:** HW to 1.1m
TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Washboring (water) to 1.6m; NMLC-Coring to 6.0m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 135.011 AHD **BORE No:** 18
EASTING: 318048.852 **PROJECT No:** 86072.01
NORTHING: 6264690.006 **DATE:** 22/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
135	0.05	ASPHALTIC CONCRETE		A	0.1				
	0.2	ROADBASE - 10mm igneous gravel with some sand							
	0.4	FILLING - apparently moderately compacted, brown sandy (fine to coarse) clay filling with some silt and fine to medium sandstone gravel, damp		A	0.5				
134	1	SILTY CLAY - hard, grey mottled brown, silty clay with some sand and fine to medium ironstone gravel, humid		A	1.0				1
				S	1.45		11,20,23 N = 43		
	1.6	SHALE - extremely low strength with some medium strength ironstone bands, extremely to highly weathered, fractured, mottled grey and red-brown shale			1.6				
133	2			C					2
	2.32								
132	3				3.0				3
	3.3			C					
131	4				4.0				4
	4.2	SHALE - low strength, moderately weathered, fractured to slightly fractured, brown and grey shale							
				C	4.55		PL(A) = 0.1		
130	5				5.0		PL(A) = 1.1		5
	5.0	SANDSTONE - high strength, slightly weathered, slightly fractured, light brown, fine to medium grained sandstone			5.4		PL(A) = 1.6		
	5.45	Bore discontinued at 5.45m - target depth reached			5.45				
129	6								6
128	7								7
127	8								8
126	9								9

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB **CASING:** HW to 1.2m
TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Washboring (water) to 1.6m; NMLC-Coring to 5.45m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318016.409
NORTHING: 6264338.794
DIP/AZIMUTH: 90°/--

BORE No: 19
PROJECT No: 86072.01
DATE: 15/2/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	FILLING - apparently moderately compacted, brown, clayey silt filling with some fine sandstone gravel and rootlets, humid		A	0.1				1m stick-up
	0.4	FILLING - apparently moderately compacted, brown and grey, gravelly (fine to coarse sandstone) clay filling with some sand and silt, humid		A	0.5				
	1			A	1.0		8,9,12 N = 21		
				S	1.45				Backfill 0.0-3.0m
	1.8	SANDY CLAY - apparently very stiff to hard, brown-grey, sandy (fine to medium) clay with some fine to medium ironstone gravel, damp							
	2.6	SANDSTONE - low to medium and high strength, highly to moderately weathered, fractured to slightly fractured, light grey and brown, fine to medium grained sandstone with some very low strength bands			2.6		PL(A) = 0.32		
					2.65				
	3				3.25		PL(A) = 2.67		Bentonite 3.0-3.5m
				C					
	3.9	SANDSTONE - high strength, highly to moderately then moderately weathered, slightly fractured, brown, medium grained sandstone with some clay seams							
	4.42				4.5		PL(A) = 1.82		
					4.7				
	5				5.55		PL(A) = 1.56		Gravel 3.5-10.1m
				C					
	6.6	SANDSTONE - high strength, slightly weathered then fresh, slightly fractured and unbroken, light grey-brown then light grey, medium grained sandstone			6.75		PL(A) = 1.36		
	7				7.5		PL(A) = 1.64		Machine slotted PVC screen 4.1-10.1m
	8				8.45		PL(A) = 1.89		
				C					
	9				9.3		PL(A) = 1.1		
					10.0		PL(A) = 1.26		

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.6m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.6m; NMLC-Coring to 10.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 10.1m (blank 0.0-4.1m; screen 4.1-10.1m; backfill 0.0-3.0m; bentonite 3.0-3.5m; gravel 3.5-10.1m; stick-up at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318016.409
NORTHING: 6264338.794
DIP/AZIMUTH: 90°/--

BORE No: 19
PROJECT No: 86072.01
DATE: 15/2/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	10.15	SANDSTONE *(continued)*		C	10.15				End cap
		Bore discontinued at 10.15m							

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.6m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.6m; NMLC-Coring to 10.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 10.1m (blank 0.0-4.1m; screen 4.1-10.1m; backfill 0.0-3.0m; bentonite 3.0-3.5m; gravel 3.5-10.1m; stick-up at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 124.374 AHD **BORE No:** 20
EASTING: 317970.298 **PROJECT No:** 86072.01
NORTHING: 6264472.595 **DATE:** 13/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
124	0.07	ASPHALTIC CONCRETE							
	0.25	CONCRETE 0.18m: two-way horizontal steel reinforcement (8mm diameter)		A	0.4 0.5				
		FILLING - variably compacted, brown, sandy (fine to coarse) clay filling with some fine to coarse gravel (sandstone and shale), damp		A	0.9 1.0				
123				S	1.45				
122	2.5	FILLING - variably compacted, light brown and grey, sandy (fine to coarse) clay filling with some fine to medium gravel (sandstone and shale and ironstone), damp		S	2.5 2.95		8,20,10/40mm refusal bouncing		
121	4.05			S	4.0		25/120mm refusal bouncing		
	4.15	SANDSTONE - very low strength, grey sandstone			4.12 4.15				
120		SANDSTONE - medium and high strength, moderately weathered, fractured and unbroken, brown, grey and orange, fine to medium grained sandstone with some extremely low strength bands			4.95		PL(A) = 1.8		
119				C					
					5.9		PL(A) = 1.9		
118		6.38-6.83m: with interbedded siltstone							
	6.78	SANDSTONE - high strength, fresh, unbroken, grey, medium grained sandstone			6.95 7.0		PL(A) = 2.7		
117					7.45		PL(A) = 1.8		
116				C					
					8.95		PL(A) = 1.4		
115		9.3-9.5m: laminite band			9.45		PL(A) = 2		
	9.5	SANDSTONE - high strength, fresh, unbroken, grey, fine to medium grained sandstone, massive							

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB/SI **CASING:** HW to 4.0m
TYPE OF BORING: Solid flight auger (TC-bit) to 4.0m; Washboring (water) to 4.15m; NMLC-Coring to 10.05m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 124.374 AHD **BORE No:** 20
EASTING: 317970.298 **PROJECT No:** 86072.01
NORTHING: 6264472.595 **DATE:** 13/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
114	10.05	SANDSTONE - description next page			10.05				
		Bore discontinued at 10.05m - target depth reached							
113	11								
112	12								
111	13								
110	14								
109	15								
108	16								
107	17								
106	18								
105	19								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB/SI **CASING:** HW to 4.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 4.0m; Washboring (water) to 4.15m; NMLC-Coring to 10.05m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 127.43 AHD
EASTING: 317992.914
NORTHING: 6264550.018
DIP/AZIMUTH: 90°/--

BORE No: 21
PROJECT No: 86072.01
DATE: 14/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
127	0.35	TOPSOIL FILLING - apparently poorly compacted, brown, sandy (fine to coarse) silt topsoil filling with some fine to medium gravel (igneous) and timber fragments, humid		A	0.1				
				A	0.5				
1	1.1	SANDSTONE - very low to low strength, brown, fine to medium grained sandstone		A	1.0		11/10mm refusal bouncing		1
				S	1.01				
126					1.1				
					1.5		PL(A) = 1.3		
	1.77								
2		LAMINITE - low to medium then medium strength, moderately and slightly weathered, fractured to slightly fractured, dark brown-grey siltstone (70%) interlaminated with brown-grey, fine to medium grained sandstone (30%) with some extremely low strength bands							2
125					2.4		PL(A) = 0.31		
				C					
3									3
124					3.35		PL(A) = 0.66		
4					4.05				4
	4.15	SANDSTONE - high strength, fresh stained and fresh, unbroken, pale grey, medium grained sandstone			4.3		PL(A) = 3.43		
123									
5									5
122					5.45		PL(A) = 1.44		
				C					
6									6
121		6.3-6.8m: siltstone bands with some fine sandstone laminations			6.4		PL(A) = 1.76		
7					7.05				7
120					7.35		PL(A) = 1.6		
8									8
119		8.4-8.55m: some siltstone bands		C					
					8.75		PL(A) = 1.85		
9									9
118					9.4		PL(A) = 1.83		
	9.7	Bore discontinued at 9.7m - target depth reached			9.7				

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** JY/MB/SI **CASING:** HW to 1.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary (water) to 1.1m; NMLC-Coring to 9.7m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 128.55 AHD
EASTING: 318031.936
NORTHING: 6264597.241
DIP/AZIMUTH: 90°/--

BORE No: 22
PROJECT No: 86072.01
DATE: 15/2/2018
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
128	0.05	ASPHALTIC CONCRETE							
	0.15	ROADBASE - 20mm igneous gravel		A	0.2				
	0.4	FILLING - apparently moderately compacted, brown, sandy (fine to coarse) clay filling with some fine to coarse sandstone gravel, damp		A	0.5				
	1.0	SANDSTONE - very low strength, pale brown-grey, fine to medium grained sandstone		A	1.0				
	1.05	SANDSTONE - high strength, highly to moderately weathered, slightly fractured, light grey-brown, fine to medium grained sandstone with some very low strength bands			1.35		PL(A) = 2.75		
127	2								
					2.35		PL(A) = 2.58		
126	2.53			C					
	3								
					3.4		PL(A) = 1.25		
125	3.5	LAMINITE - very low and medium strength, highly to moderately weathered, fractured and slightly fractured, grey-brown, fine to medium grained sandstone (70%) interbedded/ laminated with grey siltstone (30%)							
	4				4.0				
124					4.5		PL(A) = 0.91		
	5								
	5.2	SANDSTONE - medium then high strength, slightly weathered then fresh, slightly fractured and unbroken, light grey-brown to light grey, medium grained sandstone							
123				C	5.6		PL(A) = 1.18		
	6								
					6.3		PL(A) = 1.99		
122		6.5-6.62m: siltstone bands			6.55		PL(A) = 0.63		
	7				7.0				
					7.1		PL(A) = 2.61		
121									
	8				8.05		PL(A) = 2.49		
120				C					
	9				9.05		PL(A) = 1.41		
119									
	10.0				10.0				

Bore discontinued at 10.0m

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** MB/SI **CASING:** HQ to 1.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; NMLC-Coring to 10.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318084.417
NORTHING: 6264420.989
DIP/AZIMUTH: 90°/--

BORE No: 23
PROJECT No: 86072.01
DATE: 14 - 15/2/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALTIC CONCRETE		A	0.1				
	0.3	ROADBASE - 20mm igneous gravel		A	0.5				
	0.7	FILLING - apparently moderately compacted, brown, sandy (fine to coarse) clay filling with some fine to coarse sandstone gravel, humid		A	1.0				
	1	SANDY CLAY - very stiff to hard, sandy (fine to coarse) clay filling with some fine to coarse sandstone gravel, humid		S	1.45		12,15,13 N = 28		
	2								
	2.1				2.1		PL(A) = 0.33		
	2.13	SANDSTONE - low to medium and medium strength, highly to moderately and slightly weathered, fractured and slightly fractured, light grey-brown to brown, fine to medium grained sandstone with some extremely low and very low strength bands			2.15				
	3			C	3.25		PL(A) = 2.58		
	4				4.25				
	4.56	SANDSTONE - high and very high strength, highly to moderately weathered, fractured and slightly fractured, light grey-brown, medium grained sandstone with some very low strength bands			4.7		PL(A) = 0.35		
	5			C					
					5.7		PL(A) = 3.96		
	6	5.92-6.1m: medium strength							
	6.52				6.6				
	6.59				6.75		PL(A) = 3.07		
	7								
	7.23	SANDSTONE - high to very high then high strength, moderately weathered then fresh, slightly fractured then unbroken, brown then light grey, medium to coarse grained sandstone		C	7.6		PL(A) = 3.08		
	8				8.5		PL(A) = 2.19		
					8.75				
	9			C	9.5		PL(A) = 3.12		

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.1m; NMLC-Coring to 11.5m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318084.417
NORTHING: 6264420.989
DIP/AZIMUTH: 90°/--

BORE No: 23
PROJECT No: 86072.01
DATE: 14 - 15/2/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	11	SANDSTONE - high to very high then high strength, moderately weathered then fresh, slightly fractured then unbroken, brown then light grey, medium to coarse grained sandstone *(continued)*		C	10.65		PL(A) = 2.47		
					11.25		PL(A) = 2.36		
	11.5	Bore discontinued at 11.5m			11.5				
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.1m
TYPE OF BORING: Solid flight auger (TC-bit) to 2.1m; NMLC-Coring to 11.5m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318075.481
NORTHING: 6264467.634
DIP/AZIMUTH: 90°/--

BORE No: 24
PROJECT No: 86072.01
DATE: 14/2/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.3	TOPSOIL FILLING - poorly compacted, brown, clayey silt topsoil filling with some timber fragments, humid		A	0.1				
	0.6	FILLING - poorly compacted, dark brown, silty clay filling with some fine to coarse gravel (sandstone and igneous) and trace concrete rubble and rootlets, damp		A	0.5				
	1	FILLING - apparently moderately compacted, brown, sandy (fine to coarse) clay filling with some fine to coarse gravel (sandstone) and some silt, damp		A S	1.0 1.34		6,5,7 N = 12		
	1.7	SANDY CLAY - apparently very stiff, brown and grey sandy (fine to medium) clay with some fine sandstone gravel, damp							
	2.2	SANDSTONE - medium strength, highly and moderately weathered, fractured and slightly fractured, grey and brown, medium grained sandstone with some very low strength bands			2.2				
					2.7		PL(A) = 0.84		
				C	3.38		PL(A) = 0.96		
					3.45		PL(A) = 0.54		
					4.3				
					4.95		PL(A) = 0.56		
	5.77				5.67		PL(A) = 0.73		
		SANDSTONE - high strength, slightly weathered and fresh, slightly fractured and unbroken, grey, medium grained sandstone		C	6.2		PL(A) = 1.11		
					7.3				
					7.65		PL(A) = 1.21		
					8.38		PL(A) = 1.15		
				C					
					9.54		PL(A) = 1.65		

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB/SI **CASING:** HW to 2.2m
TYPE OF BORING: Solid flight auger (TC-bit) to 2.2m; NMLC-Coring to 10.25m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318075.481
NORTHING: 6264467.634
DIP/AZIMUTH: 90°/--

BORE No: 24
PROJECT No: 86072.01
DATE: 14/2/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		SANDSTONE *(continued)*		C	10.2		PL(A) = 1.06		
	10.25	Bore discontinued at 10.25m - target depth reached			10.25				

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/JB/SI **CASING:** HW to 2.2m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.2m; NMLC-Coring to 10.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318067.885
NORTHING: 6264521.583
DIP/AZIMUTH: 90°/--

BORE No: 25
PROJECT No: 86072.01
DATE: 16/2/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
		FILLING - variably compacted, dark brown, clayey silt filling with fine to coarse gravel (sandstone and igneous), humid		A	0.1				
				A	0.5				
	0.7	SANDY CLAY - very stiff, brown, sandy (fine to medium) clay with some silt and fine to medium ironstone gravel, damp		A	1.0				
				S	1.45		12,12,16 N = 28		
	2.1	SANDSTONE - extremely low and very low strength, extremely and highly weathered, slightly fractured then fractured, mottled grey and brown, fine to medium grained sandstone with some low and medium and high strength iron-cemented bands			2.1				
				C	2.8		PL(A) = 0.6		
					2.95		PL(A) = 1.3		
	4.1				4.12				
	4.22	SANDSTONE - high strength, moderately to slightly weathered, fractured to slightly fractured, brown and grey, medium grained sandstone with trace carbonaceous seams		C	5.95		PL(A) = 1.4		
					6.75		PL(A) = 1.6		
					7.12		PL(A) = 1.2		
					7.2				
					7.5		PL(A) = 1.1		
					7.95		PL(A) = 1.4		
				C	8.6		PL(A) = 1.4		
	9.0	SANDSTONE - high strength, fresh, unbroken, grey, fine to medium grained sandstone			9.0		PL(A) = 1.2		
					9.5		PL(A) = 1.4		

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.1m
TYPE OF BORING: Solid flight auger (TC-bit) to 2.1m; NMLC-Coring to 10.1m
WATER OBSERVATIONS: No free groundwater observed whilst augering
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: --
EASTING: 318067.885
NORTHING: 6264521.583
DIP/AZIMUTH: 90°/--

BORE No: 25
PROJECT No: 86072.01
DATE: 16/2/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	10.12	Bore discontinued at 10.15m - target depth reached		C	10.05 - 10.15		PL(A) = 1.8		

RIG: Comacchio 305 **DRILLER:** LC **LOGGED:** MB/SI **CASING:** HW to 2.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.1m; NMLC-Coring to 10.1m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 125.713 AHD **BORE No:** 26
EASTING: 318069.397 **PROJECT No:** 86072.01
NORTHING: 6264588.65 **DATE:** 15/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 1 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALTIC CONCRETE							Gatic cover
	0.15	ROADBASE		A	0.1				
				A	0.2				
		FILLING - apparently well compacted, brown, silty clay filling with some fine to coarse sandstone gravel and some sand (fine to coarse), damp			0.5				
125	0.8			A					
	1.1	FILLING - apparently well compacted, dark brown, silty clay filling with fine to coarse sandstone shale gravel and a trace of concrete rubble, damp			1.0				
				S			6,16,20 N = 36		
		FILLING - apparently well compacted, gravelly (fine to coarse sandstone) clay filling with some fine to coarse sand, damp			1.45				
124									Backfill 0.0-3.5m
					2.5				
				S			7,10,20 N = 30		
123					2.95				
	3.7	SANDSTONE - extremely low strength, light grey-brown, fine grained sandstone			3.7				Bentonite 3.5-4.0m
122	4.27	SANDSTONE - very low strength, moderately and highly weathered, fractured to slightly fractured, grey and brown, fine to medium grained sandstone with some high strength iron-cemented bands		C	4.35		PL(A) = 1.47		
					4.9				
121		5.17m: becoming highly weathered		C					Gravel 4.0-10.15m
120	5.7								
	5.9				5.9		PL(A) = 1.38		
119	6.75	SANDSTONE - high strength, slightly weathered, slightly fractured, brown, medium to coarse grained sandstone			6.85		PL(A) = 1.49		Machine slotted PVC screen 4.15-10.15m
				C					
118					7.7		PL(A) = 1.19		
117					8.6		PL(A) = 1.83		
					8.75				
				C					
116	9.55	SHALE - medium strength, fresh, slightly fractured, dark grey shale			9.7		PL(A) = 0.8		

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JB/MB/SI **CASING:** HW to 2.5m; HQ to 5.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 3.7m; NMLC-Coring to 10.15m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 10.15m (blank 0.4-1.5m; screen 4.15-10.15m; backfill 0.0-3.5m; bentonite 3.5-4.0m; gravel 4.0-10.15m; gatic at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Mirvac Projects Pty Ltd
PROJECT: Proposed Residential Development
LOCATION: Coonara Avenue, West Pennant Hills

SURFACE LEVEL: 125.713 AHD **BORE No:** 26
EASTING: 318069.397 **PROJECT No:** 86072.01
NORTHING: 6264588.65 **DATE:** 15/2/2018
DIP/AZIMUTH: 90°/-- **SHEET** 2 OF 2

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
115	10.15	SHALE *(continued)*		C	10.15				End cap
		Bore discontinued at 10.15m - target depth reached							
114	11								
113	12								
112	13								
111	14								
110	15								
109	16								
108	17								
107	18								
106	19								

RIG: Scout 4 **DRILLER:** RKE **LOGGED:** JB/MB/SI **CASING:** HW to 2.5m; HQ to 5.0m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 3.7m; NMLC-Coring to 10.15m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 10.15m (blank 0.4-1.5m; screen 4.15-10.15m; backfill 0.0-3.5m; bentonite 3.5-4.0m; gravel 4.0-10.15m; gatic at surface)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Attachment 11 – Laboratory Documentation

015402

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 54393
PROJECT NAME: WPH.
DATE NEEDED BY: 5 Day.
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ddenaro@jbsg.com.au; (3) mzavattaro@jbsg.com.au ckauffman@jbsg.com.au

LABORATORY BATCH NO.:
SAMPLERS: mz/ck.
QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Orgochl's	PAH	TRH/BTEX	OCP/PCB	TCLP	pH/EC	CEC	Asbestos	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
HA01 0-0.1	Soil	23/2/18		J+B+Ice		X	X	X	X		X		X			
0.3-0.4		23/2/18		J+ice+B												
0.5-0.6		23/2/18		J+Ice+B.												
HA02 0-0.1		22/2/18		J+B+Ice												
0.3-0.4		22/2/18		J+Ice+B		X	X	X	X		X		X			
0.5-0.6		22/2/18		J+Ice												
HA03 0.0-0.1		23/2/18		J+B+Ice		X	X	X	X		X		X			
0.3-0.4		23/2/18		J+Ice+B												
0.5-0.6		23/2/18		J+Ice+B												
HA04 0-0.1		22/2/18		J+B+Ice		X	X	X	X		X		X			
0.3-0.4		22/2/18		J+Ice												
HA05 0-0.1				J+B+Ice												
0.3-0.4				J+Ice+B		X	X	X	X		X		X			
HA06 0-0.1				J+B+Ice		X	X	X	Y		X		X			
0.3-0.4				J+Ice+B												
0.5-0.6				J+Ice+B.												
HA07 0-0.1		23/2/18		J+B+Ice												
0.3-0.4				J+Ice+B												
0.5-0.6				J+Ice+B.		X	X	X	Y		X	X	X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Michael Zavattaro DATE: 26/2/18 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: Elvis P DATE: OF: 26/2/18 5:14Pm	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP 8.6 deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: Amy DATE: 27/2/18 OF: Eurofins 17:14 586795	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

015403

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 543983
PROJECT NAME: WPH
DATE NEEDED BY: 5 days.
LABORATORY BATCH NO.:
SAMPLERS: MZ / CK
QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ddenaro@jbsg.com.au; (3) mzanatto@jbsg.com.au ckauffman@jbsg.com.au.
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	9 Metals	PAH	TPH/BTEX	OCP/PCB	As Asbestos	TCLP	PH/EC	CEC	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
HA08 0-0.1	SOIL	22/2/18		J+B+Ice												
0.3-0.4		22/2/18		J+Ice+B		x	x	x	x	x		x				
0.5-0.6		22/2/18		J+Ice+B.												
HA09 0-0.1		23/2/18		J+B+Ice												
0.3-0.4				J+Ice+B		x	x	x	x	x		x				
0.4-0.5				J+Ice+B.												
HA10 0-0.1				J+B+Ice		x	x	x	x	x		x				
0.3-0.4				J+Ice+B												
0.5-0.6				J+Ice+B.												
HA11 0-0.1				J+B+Ice		x	x	x	x	x		x	x			
0.3-0.4				J+Ice												
HA12 0-0.1		21/2/18		J+B+Ice												
0.3-0.4				J+Ice+B		x	x	x	x	x		x				
0.5-0.6				J+Ice												
HA13 0-0.1				J+B+Ice												
0.3-0.4				J+Ice+B		x	x	x	x	x		x				
0.5-0.6				J+Ice+B.												
0.7-0.8				J+Ice												
HA14 0-0.1				J+B+Ice		x	x	x	x	x		x				

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Michael Zanatto DATE: 26/2/18 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: Elvis D DATE: OF: 26/2/18 5:14PM	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP 8.6 deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: Amy DATE: 27/2/18 17:14 OF: EFTMCS 586795	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

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015404

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 54393	LABORATORY BATCH NO.:
PROJECT NAME: WPH	SAMPLERS: MZ / CK.
DATE NEEDED BY: 5 Days.	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ddenaro@jbsg.com.au; (3) mzavattaro@jbsg.com.au ckauffman@jbsg.com.au.

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	8 Metals	PAH	TPH/BTEX	OC/OP	TCLP	TRH/EC	CEC	Asbestos	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
HA14 0.3-0.4	SOIL	21/2/18		J + ice + B												
0.5-0.6	↓	↓		J + ice + B												
HA15 0-0.1				B + J + ice												
0.3-0.4				J + ice + B		X	X	X	X		X		X			
0.5-0.6	↓	↓		J + ice												
QA2302	SOIL	23/2/18		J + B + ICE		X	X	X	X				X			
QA2202	SOIL	22/2/18		J + B + ICE												
Rins		23/2/18				X	X	X	X							
TS		↓						X								
TB.		↓						X								

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Michael Zavattaro. DATE: 26/2/18 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: Elvis D DATE: 26/2/18 5:14pm OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP 8.6 deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: Amy DATE: 27/2/18 17:44 OF: ESMCT 586795	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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

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

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

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

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Daniel Denaro
Project name: WPH
Project ID: 54393
COC number: 15402-15404
Turn around time: 5 Day
Date/Time received: Feb 26, 2018 5:14 PM
Eurofins | mgt reference: **586795**

Sample information

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

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 8.6 degrees Celsius.

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Only volatile fractions of TRH can be performed on TS and TB samples. No bag received for samples HA01_0.3-0.4 & HA07_0.5-0.6 (asbestos analysis cancelled). 2 bags received labelled HA01_0.3-0.5, samples logged on hold.

Contact notes

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

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Daniel Denaro - ddenaro@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
Fax:

Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	HA01_0-0.1	Feb 23, 2018		Soil	M18-Fe31589	X	X		X	X	X	X	X	X	X		X	
2	HA02_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31590	X	X		X	X	X	X	X	X	X		X	
3	HA03_0.0-0.1	Feb 23, 2018		Soil	M18-Fe31591	X	X		X	X	X	X	X	X	X		X	
4	HA04_0.0-0.1	Feb 22, 2018		Soil	M18-Fe31592	X	X		X	X	X	X	X	X	X		X	
5	HA05_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31593	X	X		X	X	X	X	X	X	X		X	
6	HA06_0-0.1	Feb 22, 2018		Soil	M18-Fe31594	X	X		X	X	X	X	X	X	X		X	
7	HA07_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31595		X		X	X	X	X	X	X	X		X	
8	HA08_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31596	X	X		X	X	X	X	X	X	X		X	
9	HA09_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31597	X	X		X	X	X	X	X	X	X		X	

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Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
10	HA10_0-0.1	Feb 23, 2018		Soil	M18-Fe31598	X	X		X	X	X	X	X	X	X		X	
11	HA11_0-0.1	Feb 23, 2018		Soil	M18-Fe31599	X			X	X	X	X	X	X	X	X	X	
12	HA12_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31600	X	X		X	X	X	X	X	X	X		X	
13	HA13_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31601	X	X		X	X	X	X	X	X	X		X	
14	HA14_0-0.1	Feb 21, 2018		Soil	M18-Fe31602	X	X		X	X	X	X	X	X	X		X	
15	HA15_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31603	X	X		X	X	X	X	X	X	X		X	
16	QA2302	Feb 23, 2018		Soil	M18-Fe31604	X				X	X	X	X	X	X		X	
17	RINS	Feb 23, 2018		Water	M18-Fe31605					X	X	X	X	X			X	
18	TS	Feb 23, 2018		Water	M18-Fe31606													X
19	TB	Feb 23, 2018		Water	M18-Fe31607													X
20	HA01_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31608			X										
21	HA01_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31609			X										

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
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Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
22	HA02_0-0.1	Feb 22, 2018		Soil	M18-Fe31610			X										
23	HA02_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31611			X										
24	HA03_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31612			X										
25	HA03_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31613			X										
26	HA04_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31614			X										
27	HA05_0-0.1	Feb 22, 2018		Soil	M18-Fe31615			X										
28	HA06_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31616			X										
29	HA06_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31617			X										
30	HA07_0-0.1	Feb 23, 2018		Soil	M18-Fe31618			X										
31	HA07_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31619			X										
32	HA08_0-0.1	Feb 22, 2018		Soil	M18-Fe31620			X										
33	HA08_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31621			X										

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
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NSW 2000

Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
Fax:

Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
34	HA09_0-0.1	Feb 23, 2018		Soil	M18-Fe31622			X										
35	HA09_0.4-0.5	Feb 23, 2018		Soil	M18-Fe31623			X										
36	HA10_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31624			X										
37	HA10_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31625			X										
38	HA11_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31626			X										
39	HA12_0-0.1	Feb 21, 2018		Soil	M18-Fe31627			X										
40	HA12_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31628			X										
41	HA13_0-0.1	Feb 21, 2018		Soil	M18-Fe31629			X										
42	HA13_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31630			X										
43	HA13_0.7-0.8	Feb 21, 2018		Soil	M18-Fe31631			X										
44	HA14_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31632			X										
45	HA14_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31633			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
46	HA15_0-0.1	Feb 21, 2018		Soil	M18-Fe31634			X										
47	HA15_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31635			X										
48	QA2202	Feb 22, 2018		Soil	M18-Fe31636			X										
49	HA01_0.3-0.5	Feb 21, 2018		Soil	M18-Fe31890			X										
Test Counts						15	14	30	15	17	17	17	17	17	16	1	17	2

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Certificate of Analysis

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The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Daniel Denaro
Report	586795-AID
Project Name	WPH
Project ID	54393
Received Date	Feb 26, 2018
Date Reported	Mar 05, 2018

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral 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 for inhomogeneous samples is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the 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 WPH
Project ID 54393
Date Sampled Feb 21, 2018 to Feb 23, 2018
Report 586795-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA01_0-0.1	18-Fe31589	Feb 23, 2018	Approximate Sample 669g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA02_0.3-0.4	18-Fe31590	Feb 23, 2018	Approximate Sample 585g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA03_0.0-0.1	18-Fe31591	Feb 23, 2018	Approximate Sample 704g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA04_0.0-0.1	18-Fe31592	Feb 22, 2018	Approximate Sample 757g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA05_0.3-0.4	18-Fe31593	Feb 22, 2018	Approximate Sample 538g Sample consisted of: Brown coarse grain soil, rocks and debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA06_0-0.1	18-Fe31594	Feb 22, 2018	Approximate Sample 594g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA08_0.3-0.4	18-Fe31596	Feb 22, 2018	Approximate Sample 585g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA09_0.3-0.4	18-Fe31597	Feb 23, 2018	Approximate Sample 665g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA10_0-0.1	18-Fe31598	Feb 23, 2018	Approximate Sample 624g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA11_0-0.1	18-Fe31599	Feb 23, 2018	Approximate Sample 1128g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA12_0.3-0.4	18-Fe31600	Feb 21, 2018	Approximate Sample 729g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA13_0.3-0.4	18-Fe31601	Feb 21, 2018	Approximate Sample 842g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA14_0-0.1	18-Fe31602	Feb 21, 2018	Approximate Sample 364g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
HA15_0.3-0.4	18-Fe31603	Feb 21, 2018	Approximate Sample 667g Sample consisted of: Brown coarse grain soil, rocks and debris	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
QA2302	18-Fe31604	Feb 23, 2018	Approximate Sample 632g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Feb 27, 2018	Indefinite

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Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	HA01_0-0.1	Feb 23, 2018		Soil	M18-Fe31589	X	X		X	X	X	X	X	X	X		X	
2	HA02_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31590	X	X		X	X	X	X	X	X	X		X	
3	HA03_0.0-0.1	Feb 23, 2018		Soil	M18-Fe31591	X	X		X	X	X	X	X	X	X		X	
4	HA04_0.0-0.1	Feb 22, 2018		Soil	M18-Fe31592	X	X		X	X	X	X	X	X	X		X	
5	HA05_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31593	X	X		X	X	X	X	X	X	X		X	
6	HA06_0-0.1	Feb 22, 2018		Soil	M18-Fe31594	X	X		X	X	X	X	X	X	X		X	
7	HA07_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31595		X		X	X	X	X	X	X	X		X	
8	HA08_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31596	X	X		X	X	X	X	X	X	X		X	
9	HA09_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31597	X	X		X	X	X	X	X	X	X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
10	HA10_0-0.1	Feb 23, 2018		Soil	M18-Fe31598	X	X		X	X	X	X	X	X	X		X	
11	HA11_0-0.1	Feb 23, 2018		Soil	M18-Fe31599	X			X	X	X	X	X	X	X	X	X	
12	HA12_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31600	X	X		X	X	X	X	X	X	X		X	
13	HA13_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31601	X	X		X	X	X	X	X	X	X		X	
14	HA14_0-0.1	Feb 21, 2018		Soil	M18-Fe31602	X	X		X	X	X	X	X	X	X		X	
15	HA15_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31603	X	X		X	X	X	X	X	X	X		X	
16	QA2302	Feb 23, 2018		Soil	M18-Fe31604	X				X	X	X	X	X	X		X	
17	RINS	Feb 23, 2018		Water	M18-Fe31605					X	X	X	X	X			X	
18	TS	Feb 23, 2018		Water	M18-Fe31606													X
19	TB	Feb 23, 2018		Water	M18-Fe31607													X
20	HA01_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31608			X										
21	HA01_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31609			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X												
Brisbane Laboratory - NATA Site # 20794																		
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22	HA02_0-0.1	Feb 22, 2018		Soil	M18-Fe31610			X										
23	HA02_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31611			X										
24	HA03_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31612			X										
25	HA03_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31613			X										
26	HA04_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31614			X										
27	HA05_0-0.1	Feb 22, 2018		Soil	M18-Fe31615			X										
28	HA06_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31616			X										
29	HA06_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31617			X										
30	HA07_0-0.1	Feb 23, 2018		Soil	M18-Fe31618			X										
31	HA07_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31619			X										
32	HA08_0-0.1	Feb 22, 2018		Soil	M18-Fe31620			X										
33	HA08_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31621			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X												
Brisbane Laboratory - NATA Site # 20794																		
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34	HA09_0-0.1	Feb 23, 2018		Soil	M18-Fe31622			X										
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36	HA10_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31624			X										
37	HA10_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31625			X										
38	HA11_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31626			X										
39	HA12_0-0.1	Feb 21, 2018		Soil	M18-Fe31627			X										
40	HA12_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31628			X										
41	HA13_0-0.1	Feb 21, 2018		Soil	M18-Fe31629			X										
42	HA13_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31630			X										
43	HA13_0.7-0.8	Feb 21, 2018		Soil	M18-Fe31631			X										
44	HA14_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31632			X										
45	HA14_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31633			X										

eurofins | mgt

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Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
Fax:

Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
46	HA15_0-0.1	Feb 21, 2018		Soil	M18-Fe31634			X										
47	HA15_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31635			X										
48	QA2202	Feb 22, 2018		Soil	M18-Fe31636			X										
49	HA01_0.3-0.5	Feb 21, 2018		Soil	M18-Fe31890			X										
Test Counts						15	14	30	15	17	17	17	17	17	16	1	17	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 Fe31602 received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Matthew Quigley	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

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Daniel Denaro**

Report **586795-S**
Project name WPH
Project ID 54393
Received Date Feb 26, 2018

Client Sample ID			**HA01_0-0.1**	**HA02_0.3-0.4**	**HA03_0.0-0.1**	**HA04_0.0-0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Fe31589**	**M18-Fe31590**	**M18-Fe31591**	**M18-Fe31592**
Date Sampled			**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**	**Feb 22, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72	54	65	51
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			HA01_0-0.1	HA02_0.3-0.4	HA03_0.0-0.1	HA04_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31589	M18-Fe31590	M18-Fe31591	M18-Fe31592
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	98	104	88
p-Terphenyl-d14 (surr.)	1	%	83	101	99	85
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	85	127	103	99
Tetrachloro-m-xylene (surr.)	1	%	98	109	61	79
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	85	127	103	99
Tetrachloro-m-xylene (surr.)	1	%	98	109	61	79

Client Sample ID			HA01_0-0.1	HA02_0.3-0.4	HA03_0.0-0.1	HA04_0.0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31589	M18-Fe31590	M18-Fe31591	M18-Fe31592
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	73	28	64	28
pH (1:5 Aqueous extract at 25°C)	0.1	pH Units	8.0	5.3	5.9	6.4
% Moisture	1	%	7.8	27	6.5	27
Heavy Metals						
Arsenic	2	mg/kg	5.7	5.2	6.4	4.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	18	13	12
Copper	5	mg/kg	16	15	17	20
Lead	5	mg/kg	21	26	20	25
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.0	5.1	< 5	5.0
Zinc	5	mg/kg	40	24	30	32

Client Sample ID			HA05_0.3-0.4	HA06_0-0.1	HA07_0.5-0.6	HA08_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31593	M18-Fe31594	M18-Fe31595	M18-Fe31596
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 23, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	32	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	74	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	106	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	65	66	64	68
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			HA05_0.3-0.4	HA06_0-0.1	HA07_0.5-0.6	HA08_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31593	M18-Fe31594	M18-Fe31595	M18-Fe31596
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 23, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	122	99	87
p-Terphenyl-d14 (surr.)	1	%	86	117	95	84
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	95	143	90	101
Tetrachloro-m-xylene (surr.)	1	%	79	102	77	60
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			HA05_0.3-0.4	HA06_0-0.1	HA07_0.5-0.6	HA08_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31593	M18-Fe31594	M18-Fe31595	M18-Fe31596
Date Sampled			Feb 22, 2018	Feb 22, 2018	Feb 23, 2018	Feb 22, 2018
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	95	143	90	101
Tetrachloro-m-xylene (surr.)	1	%	79	102	77	60
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	46	41	39	23
pH (1:5 Aqueous extract at 25°C)	0.1	pH Units	6.2	6.3	5.2	6.0
% Moisture	1	%	15	8.2	7.9	11
Heavy Metals						
Arsenic	2	mg/kg	8.7	5.9	17	8.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	14	23	20
Copper	5	mg/kg	23	20	12	19
Lead	5	mg/kg	25	24	21	24
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.6	8.9	6.8	6.2
Zinc	5	mg/kg	35	42	35	36

Client Sample ID			HA09_0.3-0.4	HA10_0-0.1	HA11_0-0.1	HA12_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31597	M18-Fe31598	M18-Fe31599	M18-Fe31600
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 21, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	69	68	66	54
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			HA09_0.3-0.4	HA10_0-0.1	HA11_0-0.1	HA12_0.3-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31597	M18-Fe31598	M18-Fe31599	M18-Fe31600
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 21, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	97	96	81
p-Terphenyl-d14 (surr.)	1	%	88	90	97	87
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	100	89	91	99
Tetrachloro-m-xylene (surr.)	1	%	95	74	84	84

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA09_0.3-0.4 Soil M18-Fe31597 Feb 23, 2018	HA10_0-0.1 Soil M18-Fe31598 Feb 23, 2018	HA11_0-0.1 Soil M18-Fe31599 Feb 23, 2018	HA12_0.3-0.4 Soil M18-Fe31600 Feb 21, 2018
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	100	89	91	99
Tetrachloro-m-xylene (surr.)	1	%	95	74	84	84
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	70	66	14	15
pH (1:5 Aqueous extract at 25°C)	0.1	pH Units	5.3	5.8	6.3	6.2
% Moisture	1	%	10.0	12	3.4	12
Heavy Metals						
Arsenic	2	mg/kg	6.1	5.0	< 2	6.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	17	35	15
Copper	5	mg/kg	21	13	65	10.0
Lead	5	mg/kg	22	20	< 5	17
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	5.4	5.8	190	< 5
Zinc	5	mg/kg	33	61	82	20
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	17	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA13_0.3-0.4 Soil M18-Fe31601 Feb 21, 2018	HA14_0-0.1 Soil M18-Fe31602 Feb 21, 2018	HA15_0.3-0.4 Soil M18-Fe31603 Feb 21, 2018	QA2302 Soil M18-Fe31604 Feb 23, 2018
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	63	65	59	58

Client Sample ID			HA13_0.3-0.4	HA14_0-0.1	HA15_0.3-0.4	QA2302
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Fe31601	M18-Fe31602	M18-Fe31603	M18-Fe31604
Date Sampled			Feb 21, 2018	Feb 21, 2018	Feb 21, 2018	Feb 23, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	93	75	83	100
p-Terphenyl-d14 (surr.)	1	%	92	80	81	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	0.07	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			HA13_0.3-0.4	HA14_0-0.1	HA15_0.3-0.4	QA2302
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Fe31601**	**M18-Fe31602**	**M18-Fe31603**	**M18-Fe31604**
Date Sampled			**Feb 21, 2018**	**Feb 21, 2018**	**Feb 21, 2018**	**Feb 23, 2018**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	0.07	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	97	109	103	94
Tetrachloro-m-xylene (surr.)	1	%	86	86	97	57
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	97	109	103	94
Tetrachloro-m-xylene (surr.)	1	%	86	86	97	57
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	59	35	69	-
pH (1:5 Aqueous extract at 25°C)	0.1	pH Units	6.4	6.6	6.3	-
% Moisture	1	%	10.0	18	16	7.2
Heavy Metals						
Arsenic	2	mg/kg	4.3	5.6	9.5	5.5
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	13	21	14
Copper	5	mg/kg	17	20	19	17
Lead	5	mg/kg	41	30	22	19
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.2	11	6.9	< 5
Zinc	5	mg/kg	55	460	23	29

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Feb 28, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Feb 28, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soils by GCMS			
Organochlorine Pesticides	Melbourne	Feb 28, 2018	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Feb 28, 2018	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
pH (1:5 Aqueous extract at 25°C)	Melbourne	Feb 28, 2018	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Metals M8	Melbourne	Feb 28, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Feb 28, 2018	7 Day
- Method: LTM-INO-4030			
Cation Exchange Capacity	Melbourne	Mar 01, 2018	180 Days
- Method: LTM-MET-3060 - Cation Exchange Capacity (CEC) & Exchangeable Sodium Percentage (ESP)			
% Moisture	Melbourne	Feb 27, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
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Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
Fax:

Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	HA01_0-0.1	Feb 23, 2018		Soil	M18-Fe31589	X	X		X	X	X	X	X	X	X		X	
2	HA02_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31590	X	X		X	X	X	X	X	X	X		X	
3	HA03_0.0-0.1	Feb 23, 2018		Soil	M18-Fe31591	X	X		X	X	X	X	X	X	X		X	
4	HA04_0.0-0.1	Feb 22, 2018		Soil	M18-Fe31592	X	X		X	X	X	X	X	X	X		X	
5	HA05_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31593	X	X		X	X	X	X	X	X	X		X	
6	HA06_0-0.1	Feb 22, 2018		Soil	M18-Fe31594	X	X		X	X	X	X	X	X	X		X	
7	HA07_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31595		X		X	X	X	X	X	X	X		X	
8	HA08_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31596	X	X		X	X	X	X	X	X	X		X	
9	HA09_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31597	X	X		X	X	X	X	X	X	X		X	

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
10	HA10_0-0.1	Feb 23, 2018		Soil	M18-Fe31598	X	X		X	X	X	X	X	X	X		X	
11	HA11_0-0.1	Feb 23, 2018		Soil	M18-Fe31599	X			X	X	X	X	X	X	X	X	X	
12	HA12_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31600	X	X		X	X	X	X	X	X	X		X	
13	HA13_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31601	X	X		X	X	X	X	X	X	X		X	
14	HA14_0-0.1	Feb 21, 2018		Soil	M18-Fe31602	X	X		X	X	X	X	X	X	X		X	
15	HA15_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31603	X	X		X	X	X	X	X	X	X		X	
16	QA2302	Feb 23, 2018		Soil	M18-Fe31604	X				X	X	X	X	X	X		X	
17	RINS	Feb 23, 2018		Water	M18-Fe31605					X	X	X	X	X			X	
18	TS	Feb 23, 2018		Water	M18-Fe31606													X
19	TB	Feb 23, 2018		Water	M18-Fe31607													X
20	HA01_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31608			X										
21	HA01_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31609			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
22	HA02_0-0.1	Feb 22, 2018		Soil	M18-Fe31610			X										
23	HA02_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31611			X										
24	HA03_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31612			X										
25	HA03_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31613			X										
26	HA04_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31614			X										
27	HA05_0-0.1	Feb 22, 2018		Soil	M18-Fe31615			X										
28	HA06_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31616			X										
29	HA06_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31617			X										
30	HA07_0-0.1	Feb 23, 2018		Soil	M18-Fe31618			X										
31	HA07_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31619			X										
32	HA08_0-0.1	Feb 22, 2018		Soil	M18-Fe31620			X										
33	HA08_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31621			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
34	HA09_0-0.1	Feb 23, 2018		Soil	M18-Fe31622			X										
35	HA09_0.4-0.5	Feb 23, 2018		Soil	M18-Fe31623			X										
36	HA10_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31624			X										
37	HA10_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31625			X										
38	HA11_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31626			X										
39	HA12_0-0.1	Feb 21, 2018		Soil	M18-Fe31627			X										
40	HA12_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31628			X										
41	HA13_0-0.1	Feb 21, 2018		Soil	M18-Fe31629			X										
42	HA13_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31630			X										
43	HA13_0.7-0.8	Feb 21, 2018		Soil	M18-Fe31631			X										
44	HA14_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31632			X										
45	HA14_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31633			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
46	HA15_0-0.1	Feb 21, 2018		Soil	M18-Fe31634			X										
47	HA15_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31635			X										
48	QA2202	Feb 22, 2018		Soil	M18-Fe31636			X										
49	HA01_0.3-0.5	Feb 21, 2018		Soil	M18-Fe31890			X										
Test Counts						15	14	30	15	17	17	17	17	17	16	1	17	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.

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

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

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	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	%	109			70-130	Pass	
TRH C10-C14	%	116			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	126			70-130	Pass	
TRH C6-C10	%	102			70-130	Pass	
TRH >C10-C16	%	116			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	82			70-130	Pass	
Acenaphthylene	%	88			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	83			70-130	Pass	
Benzo(a)pyrene	%	79			70-130	Pass	
Benzo(b&j)fluoranthene	%	88			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g.h.i)perylene	%	79			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	80			70-130	Pass	
Dibenz(a.h)anthracene	%	85			70-130	Pass	
Fluoranthene	%	80			70-130	Pass	
Fluorene	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	77			70-130	Pass	
Naphthalene	%	84			70-130	Pass	
Phenanthrene	%	90			70-130	Pass	
Pyrene	%	75			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	119			70-130	Pass	
4.4'-DDE	%	108			70-130	Pass	
4.4'-DDT	%	75			70-130	Pass	
a-BHC	%	90			70-130	Pass	
Aldrin	%	104			70-130	Pass	
b-BHC	%	92			70-130	Pass	
d-BHC	%	94			70-130	Pass	
Dieldrin	%	103			70-130	Pass	
Endosulfan I	%	102			70-130	Pass	
Endosulfan II	%	104			70-130	Pass	
Endosulfan sulphate	%	99			70-130	Pass	
Endrin	%	112			70-130	Pass	
Endrin aldehyde	%	97			70-130	Pass	
Endrin ketone	%	95			70-130	Pass	
g-BHC (Lindane)	%	94			70-130	Pass	
Heptachlor	%	106			70-130	Pass	
Heptachlor epoxide	%	101			70-130	Pass	
Hexachlorobenzene	%	87			70-130	Pass	
Methoxychlor	%	80			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	81			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	104			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	109			80-120	Pass	
Copper	%	106			80-120	Pass	
Lead	%	111			80-120	Pass	
Mercury	%	100			75-125	Pass	
Nickel	%	106			80-120	Pass	
Zinc	%	104			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Fe31589	CP	%	102			75-125	Pass	
Cadmium	M18-Fe31589	CP	%	105			75-125	Pass	
Chromium	M18-Fe31589	CP	%	106			75-125	Pass	
Copper	M18-Fe31589	CP	%	109			75-125	Pass	
Lead	M18-Fe31589	CP	%	111			75-125	Pass	
Mercury	M18-Fe31589	CP	%	98			70-130	Pass	
Nickel	M18-Fe31191	NCP	%	105			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc	M18-Fe31589	CP	%	115			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Fe31591	CP	%	95			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Fe31591	CP	%	80			70-130	Pass	
Toluene	M18-Fe31591	CP	%	80			70-130	Pass	
Ethylbenzene	M18-Fe31591	CP	%	81			70-130	Pass	
m&p-Xylenes	M18-Fe31591	CP	%	82			70-130	Pass	
o-Xylene	M18-Fe31591	CP	%	82			70-130	Pass	
Xylenes - Total	M18-Fe31591	CP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Fe31591	CP	%	95			70-130	Pass	
TRH C6-C10	M18-Fe31591	CP	%	93			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Fe31591	CP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Fe31592	CP	%	113			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Fe31592	CP	%	113			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Fe31597	CP	%	90			70-130	Pass	
Acenaphthylene	M18-Fe31597	CP	%	94			70-130	Pass	
Anthracene	M18-Fe31597	CP	%	97			70-130	Pass	
Benz(a)anthracene	M18-Fe31597	CP	%	93			70-130	Pass	
Benzo(a)pyrene	M18-Fe31597	CP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Fe31597	CP	%	88			70-130	Pass	
Benzo(g.h.i)perylene	M18-Fe31597	CP	%	94			70-130	Pass	
Benzo(k)fluoranthene	M18-Fe31597	CP	%	86			70-130	Pass	
Chrysene	M18-Fe31597	CP	%	90			70-130	Pass	
Dibenz(a.h)anthracene	M18-Fe31597	CP	%	90			70-130	Pass	
Fluoranthene	M18-Fe31597	CP	%	84			70-130	Pass	
Fluorene	M18-Fe31597	CP	%	98			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Fe31597	CP	%	101			70-130	Pass	
Naphthalene	M18-Fe31597	CP	%	94			70-130	Pass	
Phenanthrene	M18-Fe31597	CP	%	102			70-130	Pass	
Pyrene	M18-Fe31597	CP	%	86			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M18-Fe31597	CP	%	123			70-130	Pass	
4.4'-DDE	M18-Fe31597	CP	%	104			70-130	Pass	
4.4'-DDT	M18-Fe31597	CP	%	100			70-130	Pass	
a-BHC	M18-Fe31597	CP	%	85			70-130	Pass	
Aldrin	M18-Fe31597	CP	%	98			70-130	Pass	
b-BHC	M18-Fe31597	CP	%	85			70-130	Pass	
d-BHC	M18-Fe31597	CP	%	94			70-130	Pass	
Dieldrin	M18-Fe31597	CP	%	98			70-130	Pass	
Endosulfan I	M18-Fe31597	CP	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	M18-Fe31597	CP	%	96			70-130	Pass	
Endosulfan sulphate	M18-Fe31597	CP	%	112			70-130	Pass	
Endrin	M18-Fe31597	CP	%	127			70-130	Pass	
Endrin aldehyde	M18-Fe31597	CP	%	91			70-130	Pass	
Endrin ketone	M18-Fe31597	CP	%	103			70-130	Pass	
g-BHC (Lindane)	M18-Fe31597	CP	%	89			70-130	Pass	
Heptachlor	M18-Fe31597	CP	%	102			70-130	Pass	
Heptachlor epoxide	M18-Fe31597	CP	%	92			70-130	Pass	
Hexachlorobenzene	M18-Fe31597	CP	%	81			70-130	Pass	
Methoxychlor	M18-Fe31597	CP	%	119			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Fe31598	CP	%	84			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Fe31598	CP	%	78			70-130	Pass	
Toluene	M18-Fe31598	CP	%	80			70-130	Pass	
Ethylbenzene	M18-Fe31598	CP	%	84			70-130	Pass	
m&p-Xylenes	M18-Fe31598	CP	%	85			70-130	Pass	
o-Xylene	M18-Fe31598	CP	%	84			70-130	Pass	
Xylenes - Total	M18-Fe31598	CP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Fe31598	CP	%	96			70-130	Pass	
TRH C6-C10	M18-Fe31598	CP	%	82			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Fe31599	CP	%	99			75-125	Pass	
Cadmium	M18-Fe31599	CP	%	102			75-125	Pass	
Chromium	M18-Fe31599	CP	%	85			75-125	Pass	
Copper	M18-Fe31599	CP	%	76			75-125	Pass	
Lead	M18-Fe31599	CP	%	100			75-125	Pass	
Mercury	M18-Fe31599	CP	%	97			70-130	Pass	
Zinc	M18-Fe31599	CP	%	68			75-125	Fail	Q08
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	M18-Fe31601	CP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Fe31602	CP	%	120			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Fe31602	CP	%	120			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Fe31589	CP	mg/kg	5.7	5.7	1.0	30%	Pass	
Cadmium	M18-Fe31589	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Fe31589	CP	mg/kg	14	14	1.0	30%	Pass	
Copper	M18-Fe31589	CP	mg/kg	16	16	1.0	30%	Pass	
Lead	M18-Fe31589	CP	mg/kg	21	21	1.0	30%	Pass	
Mercury	M18-Fe31589	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Fe31589	CP	mg/kg	6.0	6.1	2.0	30%	Pass	
Zinc	M18-Fe31589	CP	mg/kg	40	41	2.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Fe31590	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Fe31590	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Fe31590	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Fe31590	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Fe31590	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Fe31590	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Fe31590	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Fe31590	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	M18-Fe31590	CP	uS/cm	28	22	23	30%	Pass	
pH (1:5 Aqueous extract at 25°C)	M18-Fe31590	CP	pH Units	5.3	5.5	pass	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Fe31591	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Fe31591	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Fe31591	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Fe31591	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Fe31591	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Fe31591	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	M18-Fe31595	CP	uS/cm	39	38	1.0	30%	Pass	
pH (1:5 Aqueous extract at 25°C)	M18-Fe31595	CP	pH Units	5.2	5.1	pass	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Fe31596	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M18-Fe31596	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M18-Fe31596	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M18-Fe31596	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Fe31597	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Fe31597	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Fe31597	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Fe31597	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Fe31597	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Fe31597	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Fe31597	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Fe31597	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Fe31597	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Fe31598	CP	%	12	14	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Fe31598	CP	mg/kg	5.0	9.0	58	30%	Fail	Q15
Cadmium	M18-Fe31598	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Fe31598	CP	mg/kg	17	15	12	30%	Pass	
Copper	M18-Fe31598	CP	mg/kg	13	12	6.0	30%	Pass	
Lead	M18-Fe31598	CP	mg/kg	20	21	5.0	30%	Pass	
Mercury	M18-Fe31598	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Fe31598	CP	mg/kg	5.8	< 5	15	30%	Pass	
Zinc	M18-Fe31598	CP	mg/kg	61	55	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Fe31599	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M18-Fe31599	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Fe31599	CP	mg/kg	35	36	2.0	30%	Pass	
Copper	M18-Fe31599	CP	mg/kg	65	66	1.0	30%	Pass	
Lead	M18-Fe31599	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	M18-Fe31599	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Fe31599	CP	mg/kg	190	200	2.0	30%	Pass	
Zinc	M18-Fe31599	CP	mg/kg	82	85	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	M18-Fe31600	CP	uS/cm	15	14	1.4	30%	Pass	
pH (1:5 Aqueous extract at 25°C)	M18-Fe31600	CP	pH Units	6.2	6.2	pass	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Fe31601	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Fe31601	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Fe31601	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Fe31601	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Fe31601	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Fe31601	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

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

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Michael Brancati	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

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

Attention: **Daniel Denaro**

Report **586795-W**
Project name WPH
Project ID 54393
Received Date Feb 26, 2018

Client Sample ID			**RINS**	[R20]**TS**	**TB**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Fe31605**	**M18-Fe31606**	**M18-Fe31607**
Date Sampled			**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	93	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	74	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	73	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	-	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	-	-
BTEX					
Benzene	0.001	mg/L	< 0.001	100	< 0.001
Toluene	0.001	mg/L	< 0.001	100	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	98	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	91	< 0.002
o-Xylene	0.001	mg/L	< 0.001	93	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	92	< 0.003
4-Bromofluorobenzene (surr.)	1	%	133	117	134
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	-	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	-	-
Fluoranthene	0.001	mg/L	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	-	-

Client Sample ID			RINS	[R20]TS	TB
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Fe31605**	**M18-Fe31606**	**M18-Fe31607**
Date Sampled			**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Naphthalene	0.001	mg/L	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	-	-
Pyrene	0.001	mg/L	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	54	-	-
p-Terphenyl-d14 (surr.)	1	%	104	-	-
Organochlorine Pesticides					
Chlordanes - Total	0.001	mg/L	< 0.001	-	-
4.4'-DDD	0.0001	mg/L	< 0.0001	-	-
4.4'-DDE	0.0001	mg/L	< 0.0001	-	-
4.4'-DDT	0.0001	mg/L	< 0.0001	-	-
a-BHC	0.0001	mg/L	< 0.0001	-	-
Aldrin	0.0001	mg/L	< 0.0001	-	-
b-BHC	0.0001	mg/L	< 0.0001	-	-
d-BHC	0.0001	mg/L	< 0.0001	-	-
Dieldrin	0.0001	mg/L	< 0.0001	-	-
Endosulfan I	0.0001	mg/L	< 0.0001	-	-
Endosulfan II	0.0001	mg/L	< 0.0001	-	-
Endosulfan sulphate	0.0001	mg/L	< 0.0001	-	-
Endrin	0.0001	mg/L	< 0.0001	-	-
Endrin aldehyde	0.0001	mg/L	< 0.0001	-	-
Endrin ketone	0.0001	mg/L	< 0.0001	-	-
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	-	-
Heptachlor	0.0001	mg/L	< 0.0001	-	-
Heptachlor epoxide	0.0001	mg/L	< 0.0001	-	-
Hexachlorobenzene	0.0001	mg/L	< 0.0001	-	-
Methoxychlor	0.0001	mg/L	< 0.0001	-	-
Toxaphene	0.01	mg/L	< 0.01	-	-
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	-	-
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	-	-
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	-	-
Dibutylchlorendate (surr.)	1	%	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	67	-	-
Polychlorinated Biphenyls					
Aroclor-1016	0.001	mg/L	< 0.001	-	-
Aroclor-1221	0.001	mg/L	< 0.001	-	-
Aroclor-1232	0.001	mg/L	< 0.001	-	-
Aroclor-1242	0.001	mg/L	< 0.001	-	-
Aroclor-1248	0.001	mg/L	< 0.001	-	-
Aroclor-1254	0.001	mg/L	< 0.001	-	-
Aroclor-1260	0.001	mg/L	< 0.001	-	-
Total PCB*	0.001	mg/L	< 0.0001	-	-
Dibutylchlorendate (surr.)	1	%	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	67	-	-

Client Sample ID			RINS	R20TS	TB
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Fe31605**	**M18-Fe31606**	**M18-Fe31607**
Date Sampled			**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	0.001	mg/L	< 0.001	-	-
Cadmium	0.0002	mg/L	< 0.0002	-	-
Chromium	0.001	mg/L	< 0.001	-	-
Copper	0.001	mg/L	< 0.001	-	-
Lead	0.001	mg/L	< 0.001	-	-
Mercury	0.0001	mg/L	< 0.0001	-	-
Nickel	0.001	mg/L	< 0.001	-	-
Zinc	0.005	mg/L	< 0.005	-	-

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 28, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Melbourne	Feb 28, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Mar 02, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Feb 28, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Mar 02, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Mar 02, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			
Organochlorine Pesticides	Melbourne	Mar 02, 2018	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Melbourne	Mar 02, 2018	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8	Melbourne	Feb 28, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
Fax:

Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	HA01_0-0.1	Feb 23, 2018		Soil	M18-Fe31589	X	X		X	X	X	X	X	X	X		X	
2	HA02_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31590	X	X		X	X	X	X	X	X	X		X	
3	HA03_0.0-0.1	Feb 23, 2018		Soil	M18-Fe31591	X	X		X	X	X	X	X	X	X		X	
4	HA04_0.0-0.1	Feb 22, 2018		Soil	M18-Fe31592	X	X		X	X	X	X	X	X	X		X	
5	HA05_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31593	X	X		X	X	X	X	X	X	X		X	
6	HA06_0-0.1	Feb 22, 2018		Soil	M18-Fe31594	X	X		X	X	X	X	X	X	X		X	
7	HA07_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31595		X		X	X	X	X	X	X	X		X	
8	HA08_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31596	X	X		X	X	X	X	X	X	X		X	
9	HA09_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31597	X	X		X	X	X	X	X	X	X		X	

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NSW 2000

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Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
10	HA10_0-0.1	Feb 23, 2018		Soil	M18-Fe31598	X	X		X	X	X	X	X	X	X		X	
11	HA11_0-0.1	Feb 23, 2018		Soil	M18-Fe31599	X			X	X	X	X	X	X	X	X	X	
12	HA12_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31600	X	X		X	X	X	X	X	X	X		X	
13	HA13_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31601	X	X		X	X	X	X	X	X	X		X	
14	HA14_0-0.1	Feb 21, 2018		Soil	M18-Fe31602	X	X		X	X	X	X	X	X	X		X	
15	HA15_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31603	X	X		X	X	X	X	X	X	X		X	
16	QA2302	Feb 23, 2018		Soil	M18-Fe31604	X				X	X	X	X	X	X		X	
17	RINS	Feb 23, 2018		Water	M18-Fe31605					X	X	X	X	X			X	
18	TS	Feb 23, 2018		Water	M18-Fe31606													X
19	TB	Feb 23, 2018		Water	M18-Fe31607													X
20	HA01_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31608			X										
21	HA01_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31609			X										

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Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
22	HA02_0-0.1	Feb 22, 2018		Soil	M18-Fe31610			X										
23	HA02_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31611			X										
24	HA03_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31612			X										
25	HA03_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31613			X										
26	HA04_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31614			X										
27	HA05_0-0.1	Feb 22, 2018		Soil	M18-Fe31615			X										
28	HA06_0.3-0.4	Feb 22, 2018		Soil	M18-Fe31616			X										
29	HA06_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31617			X										
30	HA07_0-0.1	Feb 23, 2018		Soil	M18-Fe31618			X										
31	HA07_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31619			X										
32	HA08_0-0.1	Feb 22, 2018		Soil	M18-Fe31620			X										
33	HA08_0.5-0.6	Feb 22, 2018		Soil	M18-Fe31621			X										

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Project Name: WPH
Project ID: 54393

Order No.:
Report #: 586795
Phone: 02 8245 0300
Fax:

Received: Feb 26, 2018 5:14 PM
Due: Mar 5, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C)	HOLD	pH (1:5 Aqueous extract at 25°C)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
34	HA09_0-0.1	Feb 23, 2018		Soil	M18-Fe31622			X										
35	HA09_0.4-0.5	Feb 23, 2018		Soil	M18-Fe31623			X										
36	HA10_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31624			X										
37	HA10_0.5-0.6	Feb 23, 2018		Soil	M18-Fe31625			X										
38	HA11_0.3-0.4	Feb 23, 2018		Soil	M18-Fe31626			X										
39	HA12_0-0.1	Feb 21, 2018		Soil	M18-Fe31627			X										
40	HA12_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31628			X										
41	HA13_0-0.1	Feb 21, 2018		Soil	M18-Fe31629			X										
42	HA13_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31630			X										
43	HA13_0.7-0.8	Feb 21, 2018		Soil	M18-Fe31631			X										
44	HA14_0.3-0.4	Feb 21, 2018		Soil	M18-Fe31632			X										
45	HA14_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31633			X										

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Melbourne Laboratory - NATA Site # 1254 & 14271							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 # 23736																		
46	HA15_0-0.1	Feb 21, 2018		Soil	M18-Fe31634			X										
47	HA15_0.5-0.6	Feb 21, 2018		Soil	M18-Fe31635			X										
48	QA2202	Feb 22, 2018		Soil	M18-Fe31636			X										
49	HA01_0.3-0.5	Feb 21, 2018		Soil	M18-Fe31890			X										
Test Counts						15	14	30	15	17	17	17	17	17	16	1	17	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.

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	< 0.0001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	101			70-130	Pass	
Naphthalene	%	101			70-130	Pass	
TRH C6-C10	%	92			70-130	Pass	
TRH C6-C10	%	92			70-130	Pass	
TRH >C10-C16	%	71			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	90			70-130	Pass	
TRH C10-C14	%	77			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	87			70-130	Pass	
Ethylbenzene	%	84			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	
Xylenes - Total	%	83			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	99			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	78			70-130	Pass	
Benz(a)anthracene	%	115			70-130	Pass	
Benzo(a)pyrene	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	%	127			70-130	Pass	
Benzo(g.h.i)perylene	%	121			70-130	Pass	
Benzo(k)fluoranthene	%	128			70-130	Pass	
Chrysene	%	110			70-130	Pass	
Dibenz(a.h)anthracene	%	123			70-130	Pass	
Fluoranthene	%	125			70-130	Pass	
Fluorene	%	94			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	121			70-130	Pass	
Naphthalene	%	77			70-130	Pass	
Phenanthrene	%	107			70-130	Pass	
Pyrene	%	123			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	122			70-130	Pass	
4.4'-DDD	%	129			70-130	Pass	
4.4'-DDE	%	97			70-130	Pass	
4.4'-DDT	%	116			70-130	Pass	
a-BHC	%	114			70-130	Pass	
Aldrin	%	88			70-130	Pass	
b-BHC	%	115			70-130	Pass	
d-BHC	%	130			70-130	Pass	
Dieldrin	%	94			70-130	Pass	
Endosulfan I	%	92			70-130	Pass	
Endosulfan II	%	101			70-130	Pass	
Endosulfan sulphate	%	124			70-130	Pass	
Endrin	%	113			70-130	Pass	
Endrin aldehyde	%	107			70-130	Pass	
Endrin ketone	%	129			70-130	Pass	
g-BHC (Lindane)	%	118			70-130	Pass	
Heptachlor	%	127			70-130	Pass	
Heptachlor epoxide	%	91			70-130	Pass	
Methoxychlor	%	123			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	97			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	93			80-120	Pass	
Lead	%	100			80-120	Pass	
Mercury	%	100			75-125	Pass	
Nickel	%	95			80-120	Pass	
Zinc	%	98			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Fe31505	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Fe31505	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	S18-Fe27760	NCP	%	71			70-130	Pass	
Acenaphthylene	S18-Fe27760	NCP	%	77			70-130	Pass	
Anthracene	S18-Fe27760	NCP	%	71			70-130	Pass	
Benz(a)anthracene	S18-Fe27760	NCP	%	93			70-130	Pass	
Benzo(a)pyrene	S18-Fe27760	NCP	%	70			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Fe27760	NCP	%	77			70-130	Pass	
Benzo(g.h.i)perylene	S18-Fe27760	NCP	%	75			70-130	Pass	
Benzo(k)fluoranthene	S18-Fe27760	NCP	%	89			70-130	Pass	
Chrysene	S18-Fe27760	NCP	%	72			70-130	Pass	
Dibenz(a.h)anthracene	S18-Fe27760	NCP	%	96			70-130	Pass	
Fluoranthene	S18-Fe27760	NCP	%	94			70-130	Pass	
Fluorene	S18-Fe27760	NCP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-Fe27760	NCP	%	91			70-130	Pass	
Naphthalene	M18-Fe28561	NCP	%	79			70-130	Pass	
Phenanthrene	S18-Fe27760	NCP	%	77			70-130	Pass	
Pyrene	S18-Fe27760	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M18-Fe28627	NCP	%	84			70-130	Pass	
4.4'-DDD	M18-Fe28627	NCP	%	126			70-130	Pass	
4.4'-DDE	M18-Fe28627	NCP	%	76			70-130	Pass	
4.4'-DDT	M18-Fe28627	NCP	%	118			70-130	Pass	
a-BHC	M18-Fe28627	NCP	%	85			70-130	Pass	
Aldrin	M18-Fe28627	NCP	%	77			70-130	Pass	
b-BHC	M18-Fe28627	NCP	%	92			70-130	Pass	
d-BHC	M18-Fe28627	NCP	%	89			70-130	Pass	
Dieldrin	M18-Fe28627	NCP	%	88			70-130	Pass	
Endosulfan I	M18-Fe28627	NCP	%	88			70-130	Pass	
Endosulfan II	M18-Fe28627	NCP	%	106			70-130	Pass	
Endosulfan sulphate	M18-Fe28627	NCP	%	108			70-130	Pass	
Endrin	M18-Fe28627	NCP	%	129			70-130	Pass	
Endrin aldehyde	M18-Fe28627	NCP	%	106			70-130	Pass	
Endrin ketone	M18-Fe28561	NCP	%	102			70-130	Pass	
g-BHC (Lindane)	M18-Fe28627	NCP	%	80			70-130	Pass	
Heptachlor	M18-Fe28627	NCP	%	108			70-130	Pass	
Heptachlor epoxide	M18-Fe28627	NCP	%	95			70-130	Pass	
Hexachlorobenzene	M18-Fe28627	NCP	%	77			70-130	Pass	
Methoxychlor	M18-Fe28627	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Fe32661	NCP	%	92			75-125	Pass	
Cadmium	M18-Fe32661	NCP	%	97			75-125	Pass	
Chromium	M18-Fe32661	NCP	%	96			75-125	Pass	
Copper	M18-Fe32661	NCP	%	92			75-125	Pass	
Lead	M18-Fe32661	NCP	%	99			75-125	Pass	
Mercury	M18-Fe32661	NCP	%	97			70-130	Pass	
Nickel	M18-Fe32661	NCP	%	95			75-125	Pass	
Zinc	M18-Fe32661	NCP	%	94			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Fe32068	NCP	mg/L	2.1	2.1	3.0	30%	Pass	
TRH >C16-C34	M18-Fe32068	NCP	mg/L	0.2	0.2	1.0	30%	Pass	
TRH >C34-C40	M18-Fe32068	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Fe32068	NCP	mg/L	1.9	2.0	5.0	30%	Pass	
TRH C15-C28	M18-Fe32068	NCP	mg/L	0.3	0.4	3.0	30%	Pass	
TRH C29-C36	M18-Fe32068	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S18-Fe27757	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S18-Fe27757	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
a-BHC	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	M18-Fe31174	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Toxaphene	M18-Fe31174	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1221	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1232	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1242	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1248	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1254	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1260	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total PCB*	M18-Fe31174	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Fe32661	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M18-Fe32661	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-Fe32661	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-Fe32661	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M18-Fe32661	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-Fe32661	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-Fe32661	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	M18-Fe32661	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

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

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

015405

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 54393
PROJECT NAME: WPH
DATE NEEDED BY: 5 Days.

LABORATORY BATCH NO.:
SAMPLERS: MZ/CC.
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ...Idenaro.....@jbsg.com.au; (3) ...mzavattaro.....@jbsg.com.au ckaufman@jbsg.com.au.

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	8 Metals	PAH	TPH/BTEX	OCP/PCB	TCLP	PH/EC	CEC	Asbestos															TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1	QC2302	SOIL	23/2/18		B+J+ICE		X	X	X	X				X																	
2	QC2202	SOIL	22/2/18		B+J+ICE																										

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 166043
Date Received: 27/2
Time Received: 1100
Received by: PH
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Michael Zavattaro DATE: 26/2/18 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: PH DATE: 27/2 OF: ES	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
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CERTIFICATE OF ANALYSIS 186043

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Daniel Denaro, C Kauffman, M. Zawattaro
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**54393, WPH**
Number of Samples	2 Soil
Date samples received	27/02/2018
Date completed instructions received	27/02/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	06/03/2018
Date of Issue	05/03/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu
Authorised by Asbestos Approved Signatory: Paul Ching

Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Paul Ching, Senior Analyst
Steven Luong, Senior Chemist

Authorised By

David Springer, General Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date extracted	-	28/02/2018
Date analysed	-	28/02/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	96

svTRH (C10-C40) in Soil		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date extracted	-	28/02/2018
Date analysed	-	01/03/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	93

PAHs in Soil		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date extracted	-	28/02/2018
Date analysed	-	28/02/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	104

Organochlorine Pesticides in soil		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date extracted	-	28/02/2018
Date analysed	-	02/03/2018
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	100

PCBs in Soil		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date extracted	-	28/02/2018
Date analysed	-	02/03/2018
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	100

Acid Extractable metals in soil		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date prepared	-	28/02/2018
Date analysed	-	28/02/2018
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	16
Copper	mg/kg	20
Lead	mg/kg	16
Mercury	mg/kg	<0.1
Nickel	mg/kg	10
Zinc	mg/kg	38

Moisture		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date prepared	-	28/02/2018
Date analysed	-	01/03/2018
Moisture	%	6.5

Asbestos ID - soils NEPM - ASB-001		
Our Reference		186043-1
Your Reference	UNITS	QC2302
Date Sampled		23/02/2018
Type of sample		Soil
Date analysed	-	05/03/2018
Sample mass tested	g	747.69
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	114	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	106	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	127	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			01/03/2018	[NT]	[NT]	[NT]	[NT]	01/03/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	131	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	131	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	84	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	109	[NT]	[NT]	[NT]	[NT]	120	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	98	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			02/03/2018	[NT]	[NT]	[NT]	[NT]	02/03/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	125	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	98	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Date analysed	-			28/02/2018	[NT]	[NT]	[NT]	[NT]	28/02/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	112	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

TAX INVOICE

JBS & G Australia Pty Ltd
Level 1, 50 Margaret St
Sydney NSW 2000
Attention: Grace Ng

Invoice No: **SY 511880**
Invoicing Date: 05/03/2018
Payment Due Date: 04/04/2018

Project Details

Project No. and Description	54393, WPH
Envirolab Report Number	186043
Purchase Order Number	

Testing Performed / Description of Service

	Unit Cost	Qty	Total Cost
vTRH & BTEX in Soil NEPM	$29.00	1	$29.00
TRH Soil C10-C40 NEPM draft	$29.00	1	$29.00
PAHs in Soil	$42.00	1	$42.00
OC/PCB Pesticides in soil	$48.00	1	$48.00
8 metals in soil	$28.00	1	$28.00
Moisture	$0.00	1	$0.00
Asbestos ID - soils NEPM*	$87.00	1	$87.00
Admin Fee	$25.00	1	$25.00
Samples on Hold	$3.00	1	$3.00
Invoice and GST Summary Details	**Total Amount:**		$291.00
	GST (10%):		$29.10
	Total Invoice Amount:		**$320.10**

Invoice Payment Options

Please Make Cheques Payable To	Envirolab Services Pty Ltd			
Please EFT To	*Account Name:*	Envirolab Services		
	NAB Swift Code:	NATAAU3303M		
	Bank:	National Australia Bank	*Branch:*	Marrickville NSW
	BSB:	082 356	*Account No:*	57981 3018
Remittance Advices To	*Fax No:*	02 9910 6299		
	Email:	accounts@envirolab.com.au		

VISA and Mastercard are accepted

PLEASE NOTE: OUR PAYMENT TERMS ARE STRICTLY 30 DAYS FROM DATE OF INVOICE

CHAIN OF CUSTODY RECORD

☑ Sydney Laboratory ☐ Brisbane Laboratory ☐ Perth Laboratory ☐ Melbourne Laboratory

Company	JBS&G	Project №	54393	Project Manager	DD
Address		Project Name	West Pennant Hills	EDD Format (ESdat, EQuIS, Custom)	
Contact Name				Sampler(s)	KY
Phone №				Handed over by	
Special Directions				Email for Invoice	
Purchase Order				Email for Results	kyeung@jbsg.com.au ddemaree@jbsg.com.au
Quote ID №					

Analysis (Note: where metals are requested, please specify Total or Filtered; SUITE code must be used to access SUITE pricing)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	TRH / BTEX	OCP	8 metals	PAH (low levels)	MI, EC, alkalinity	VOC	BTEX
1	MW01	23/2	W	X	X	X	X	X	X	
2	~~MW10~~ MW07			X	X	X	X	X	X	
3	MW19			X	X	X	X	X	X	
4	RINS-0223			X	X	X	X		X	
5	TS									X
6	SB									X
7	QC 2018 0223			X	X	X	X	X	X	
8										
9										
10										
	Total Counts									

Containers: 1L Plastic | 250mL Plastic | 125mL Plastic | 200mL Amber Glass | 40mL VOA Vial | 500mL PFAS Bottle | Jar (Circle or HDPE) | Other (Jar ~~or~~ 5496; WA Guidelines)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)
☐ Overnight (Saint)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☒ 5 Day ☐ Other ( )
*Confirmation apply

Sample Comments / Dangerous Goods Hazard Warning

Method of Shipment	☐ Courier (#)	☑ Hand Delivered	☐ Postal	Name: K. YEUNG	Signature	Date: 23.2.18	Time
Eurofins | mgt Laboratory Use Only	Received By: Jack Wallis	SYD | BNE | MEL | PER | ADL | NTL | DRW		Signature		Date: 23/2/18	Time: 2.50
	Received By	SYD | BNE | MEL | PER | ADL | NTL | DRW		Signature		Date: / /	Time: :

Temperature: 2.3°C Report №

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

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

Page 1 of 1 QS3008_R7 Uncontrolled Dr. R Somers Approved by IT Lab Manager on 17 August 2017

#586223

eurofins | mgt

Melbourne
3-5 Kingston Town Close
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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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

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

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW) P/L**
Contact name:	Daniel Denaro
Project name:	WEST PENNANT HILLS
Project ID:	54393
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Feb 23, 2018 2:50 PM
Eurofins | mgt reference:	**586223**

Sample information

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

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 2.3 degrees Celsius.

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Daniel Denaro - ddenaro@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

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web : www.eurofins.com.au

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NATA # 1261 Site # 20794

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: WEST PENNANT HILLS
Project ID: 54393

Order No.:
Report #: 586223
Phone: 02 8245 0300
Fax:

Received: Feb 23, 2018 2:50 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Conductivity (at 25°C)	pH (at 25°C)	Total Alkalinity (as CaCO3)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8 filtered	BTEX	Volatile Organics	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	MW01	Feb 23, 2018		Water	S18-Fe27713	X	X	X		X	X	X	X	X	
2	MW07	Feb 23, 2018		Water	S18-Fe27714	X	X	X		X	X	X	X	X	
3	MW19	Feb 23, 2018		Water	S18-Fe27715	X	X	X		X	X	X	X	X	
4	RINS_0223	Feb 23, 2018		Water	S18-Fe27716					X	X	X	X	X	
5	TS	Feb 23, 2018		Water	S18-Fe27717										X
6	SB	Feb 23, 2018		Water	S18-Fe27718										X
7	QC20180223	Feb 23, 2018		Water	S18-Fe27719	X	X	X		X	X	X	X	X	
8	MW01	Feb 23, 2018		Water (Trace)	S18-Fe27756				X						
9	MW07	Feb 23, 2018		Water (Trace)	S18-Fe27757				X						

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web : www.eurofins.com.au

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: WEST PENNANT HILLS
Project ID: 54393

Order No.:
Report #: 586223
Phone: 02 8245 0300
Fax:

Received: Feb 23, 2018 2:50 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Conductivity (at 25°C)	pH (at 25°C)	Total Alkalinity (as CaCO3)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8 filtered	BTEX	Volatile Organics	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
10	MW19	Feb 23, 2018		Water (Trace)	S18-Fe27758				X						
11	RINS_0223	Feb 23, 2018		Water (Trace)	S18-Fe27759				X						
12	QC20180223	Feb 23, 2018		Water (Trace)	S18-Fe27760				X						
Test Counts						4	4	4	5	5	5	5	5	5	2

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Daniel Denaro**

Report **586223-W**
Project name WEST PENNANT HILLS
Project ID 54393
Received Date Feb 23, 2018

Client Sample ID			**MW01**	**MW07**	**MW19**	**RINS_0223**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-Fe27713**	**S18-Fe27714**	**S18-Fe27715**	**S18-Fe27716**
Date Sampled			**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	66	71	87	84
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW01	MW07	MW19	RINS_0223
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S18-Fe27713	S18-Fe27714	S18-Fe27715	S18-Fe27716
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	0.006	0.011	0.008	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	0.009	0.014	0.012	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	0.002	0.003	0.002	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	0.009	0.014	0.012	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	0.009	0.014	0.012	< 0.005
4-Bromofluorobenzene (surr.)	1	%	66	71	87	84
Toluene-d8 (surr.)	1	%	65	70	85	83

Client Sample ID			MW01	MW07	MW19	RINS_0223
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-Fe27713**	**S18-Fe27714**	**S18-Fe27715**	**S18-Fe27716**
Date Sampled			**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**	**Feb 23, 2018**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toxaphene	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	117	75	91	92
Tetrachloro-m-xylene (surr.)	1	%	54	53	71	59
Conductivity (at 25°C)	1	uS/cm	2400	260	450	-
pH (at 25°C)	0.1	pH Units	7.3	6.6	6.9	-
Alkalinity (speciated)						
Total Alkalinity (as CaCO3)	20	mg/L	180	37	140	-
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	0.008	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	0.004	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.009	0.015	0.003	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.009	0.002	0.011	< 0.001
Zinc (filtered)	0.005	mg/L	0.030	0.031	0.019	< 0.005

Client Sample ID			TS	SB	QC20180223	MW01
Sample Matrix			Water	Water	Water	Water (Trace)
Eurofins | mgt Sample No.			S18-Fe27717	S18-Fe27718	S18-Fe27719	S18-Fe27756
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	80	< 0.01	< 0.01	-
TRH C6-C10	0.02	mg/L	92	< 0.02	< 0.02	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	< 0.02	-
TRH >C10-C16	0.05	mg/L	-	-	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	-	< 0.05	-
TRH >C16-C34	0.1	mg/L	-	-	< 0.1	-
TRH >C34-C40	0.1	mg/L	-	-	< 0.1	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	92	< 0.02	< 0.02	-
TRH C10-C14	0.05	mg/L	-	-	< 0.05	-
TRH C15-C28	0.1	mg/L	-	-	< 0.1	-
TRH C29-C36	0.1	mg/L	-	-	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	-	-	< 0.1	-
BTEX						
Benzene	0.001	mg/L	95	< 0.001	< 0.001	-
Toluene	0.001	mg/L	87	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	82	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	80	< 0.002	< 0.002	-
o-Xylene	0.001	mg/L	86	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	82	< 0.003	< 0.003	-
4-Bromofluorobenzene (surr.)	1	%	88	101	86	-
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	-	-	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	-	-	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	-	-	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	-	-	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	-	-	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	-	-	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	-	-	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	-	-	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	-	-	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	-	-	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	-	-	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	-	-	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	-	-	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	-	-	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	-	-	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	-	-	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	-	-	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	-	-	< 0.005	-
4-Chlorotoluene	0.001	mg/L	-	-	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	-	-	< 0.001	-
Allyl chloride	0.001	mg/L	-	-	< 0.001	-
Benzene	0.001	mg/L	-	-	< 0.001	-
Bromobenzene	0.001	mg/L	-	-	< 0.001	-
Bromochloromethane	0.001	mg/L	-	-	< 0.001	-
Bromodichloromethane	0.001	mg/L	-	-	0.011	-
Bromoform	0.001	mg/L	-	-	< 0.001	-
Bromomethane	0.001	mg/L	-	-	< 0.001	-

Client Sample ID			TS	SB	QC20180223	MW01
Sample Matrix			Water	Water	Water	Water (Trace)
Eurofins | mgt Sample No.			S18-Fe27717	S18-Fe27718	S18-Fe27719	S18-Fe27756
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Carbon disulfide	0.001	mg/L	-	-	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	-	-	< 0.001	-
Chlorobenzene	0.001	mg/L	-	-	< 0.001	-
Chloroethane	0.001	mg/L	-	-	< 0.001	-
Chloroform	0.005	mg/L	-	-	0.014	-
Chloromethane	0.001	mg/L	-	-	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	-	-	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	-	-	< 0.001	-
Dibromochloromethane	0.001	mg/L	-	-	0.003	-
Dibromomethane	0.001	mg/L	-	-	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	-	-	< 0.001	-
Ethylbenzene	0.001	mg/L	-	-	< 0.001	-
Iodomethane	0.001	mg/L	-	-	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	-	-	< 0.001	-
m&p-Xylenes	0.002	mg/L	-	-	< 0.002	-
Methylene Chloride	0.001	mg/L	-	-	< 0.001	-
o-Xylene	0.001	mg/L	-	-	< 0.001	-
Styrene	0.001	mg/L	-	-	< 0.001	-
Tetrachloroethene	0.001	mg/L	-	-	< 0.001	-
Toluene	0.001	mg/L	-	-	< 0.001	-
trans-1.2-Dichloroethene	0.001	mg/L	-	-	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	-	-	< 0.001	-
Trichloroethene	0.001	mg/L	-	-	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	-	-	< 0.001	-
Vinyl chloride	0.001	mg/L	-	-	< 0.001	-
Xylenes - Total	0.003	mg/L	-	-	< 0.003	-
Total MAH*	0.003	mg/L	-	-	< 0.003	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	-	-	0.014	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	-	-	0.014	-
4-Bromofluorobenzene (surr.)	1	%	-	-	86	-
Toluene-d8 (surr.)	1	%	-	-	82	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.00005	mg/L	-	-	-	< 0.00005
Acenaphthylene	0.00005	mg/L	-	-	-	< 0.00005
Anthracene	0.00004	mg/L	-	-	-	< 0.00004
Benz(a)anthracene	0.00005	mg/L	-	-	-	< 0.00005
Benzo(a)pyrene	0.00001	mg/L	-	-	-	< 0.00001
Benzo(b&j)fluoranthene[N07]	0.00005	mg/L	-	-	-	< 0.00005
Benzo(g.h.i)perylene	0.00005	mg/L	-	-	-	< 0.00005
Benzo(k)fluoranthene	0.00005	mg/L	-	-	-	< 0.00005
Chrysene	0.00005	mg/L	-	-	-	< 0.00005
Dibenz(a.h)anthracene	0.00005	mg/L	-	-	-	< 0.00005
Fluoranthene	0.00005	mg/L	-	-	-	< 0.00005
Fluorene	0.00005	mg/L	-	-	-	< 0.00005
Indeno(1.2.3-cd)pyrene	0.00005	mg/L	-	-	-	< 0.00005
Naphthalene	0.00005	mg/L	-	-	-	< 0.00005
Phenanthrene	0.00005	mg/L	-	-	-	< 0.00005
Pyrene	0.00005	mg/L	-	-	-	< 0.00005
Total PAH*	0.00005	mg/L	-	-	-	< 0.00001

Client Sample ID			TS	SB	QC20180223	MW01
Sample Matrix			Water	Water	Water	Water (Trace)
Eurofins | mgt Sample No.			S18-Fe27717	S18-Fe27718	S18-Fe27719	S18-Fe27756
Date Sampled			Feb 23, 2018	Feb 23, 2018	Feb 23, 2018	Feb 23, 2018
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
2-Fluorobiphenyl (surr.)	1	%	-	-	-	58
p-Terphenyl-d14 (surr.)	1	%	-	-	-	84
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	-	-	< 0.001	-
4.4'-DDD	0.0001	mg/L	-	-	< 0.0001	-
4.4'-DDE	0.0001	mg/L	-	-	< 0.0001	-
4.4'-DDT	0.0001	mg/L	-	-	< 0.0001	-
a-BHC	0.0001	mg/L	-	-	< 0.0001	-
Aldrin	0.0001	mg/L	-	-	< 0.0001	-
b-BHC	0.0001	mg/L	-	-	< 0.0001	-
d-BHC	0.0001	mg/L	-	-	< 0.0001	-
Dieldrin	0.0001	mg/L	-	-	< 0.0001	-
Endosulfan I	0.0001	mg/L	-	-	< 0.0001	-
Endosulfan II	0.0001	mg/L	-	-	< 0.0001	-
Endosulfan sulphate	0.0001	mg/L	-	-	< 0.0001	-
Endrin	0.0001	mg/L	-	-	< 0.0001	-
Endrin aldehyde	0.0001	mg/L	-	-	< 0.0001	-
Endrin ketone	0.0001	mg/L	-	-	< 0.0001	-
g-BHC (Lindane)	0.0001	mg/L	-	-	< 0.0001	-
Heptachlor	0.0001	mg/L	-	-	< 0.0001	-
Heptachlor epoxide	0.0001	mg/L	-	-	< 0.0001	-
Hexachlorobenzene	0.0001	mg/L	-	-	< 0.0001	-
Methoxychlor	0.0001	mg/L	-	-	< 0.0001	-
Toxaphene	0.01	mg/L	-	-	< 0.01	-
Aldrin and Dieldrin (Total)*	0.0001	mg/L	-	-	< 0.0001	-
DDT + DDE + DDD (Total)*	0.0001	mg/L	-	-	< 0.0001	-
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	-	-	< 0.001	-
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	-	-	< 0.001	-
Dibutylchlorendate (surr.)	1	%	-	-	113	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	71	-
Conductivity (at 25°C)	1	uS/cm	-	-	270	-
pH (at 25°C)	0.1	pH Units	-	-	6.6	-
Alkalinity (speciated)						
Total Alkalinity (as CaCO3)	20	mg/L	-	-	39	-
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	-	-	< 0.001	-
Cadmium (filtered)	0.0002	mg/L	-	-	< 0.0002	-
Chromium (filtered)	0.001	mg/L	-	-	< 0.001	-
Copper (filtered)	0.001	mg/L	-	-	0.003	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Mercury (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Nickel (filtered)	0.001	mg/L	-	-	0.002	-
Zinc (filtered)	0.005	mg/L	-	-	0.025	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	MW07 Water (Trace) S18-Fe27757 Feb 23, 2018	MW19 Water (Trace) S18-Fe27758 Feb 23, 2018	RINS_0223 Water (Trace) S18-Fe27759 Feb 23, 2018	QC20180223 Water (Trace) S18-Fe27760 Feb 23, 2018
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Acenaphthylene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Anthracene	0.00004	mg/L	< 0.00004	< 0.00004	< 0.00004	< 0.00004
Benz(a)anthracene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Benzo(a)pyrene	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene[N07]	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Benzo(g.h.i)perylene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Benzo(k)fluoranthene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Chrysene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Dibenz(a.h)anthracene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Fluoranthene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Fluorene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Indeno(1.2.3-cd)pyrene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Naphthalene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Phenanthrene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Pyrene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Total PAH*	0.00005	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
2-Fluorobiphenyl (surr.)	1	%	51	77	59	67
p-Terphenyl-d14 (surr.)	1	%	112	91	100	64

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 26, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Melbourne	Feb 26, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Feb 27, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Feb 26, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Feb 27, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Melbourne	Feb 26, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Polycyclic Aromatic Hydrocarbons	Melbourne	Feb 27, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			
Organochlorine Pesticides	Melbourne	Feb 27, 2018	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Conductivity (at 25°C)	Melbourne	Feb 26, 2018	28 Day
- Method: LTM-INO-4030			
pH (at 25°C)	Melbourne	Feb 26, 2018	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Alkalinity (speciated)	Melbourne	Feb 26, 2018	14 Day
- Method: APHA 2320 Alkalinity by Titration			
Metals M8 filtered	Melbourne	Feb 26, 2018	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Project Name: WEST PENNANT HILLS
Project ID: 54393

Order No.:
Report #: 586223
Phone: 02 8245 0300
Fax:

Received: Feb 23, 2018 2:50 PM
Due: Mar 2, 2018
Priority: 5 Day
Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Conductivity (at 25°C)	pH (at 25°C)	Total Alkalinity (as CaCO3)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8 filtered	BTEX	Volatile Organics	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	MW01	Feb 23, 2018		Water	S18-Fe27713	X	X	X		X	X	X	X	X	
2	MW07	Feb 23, 2018		Water	S18-Fe27714	X	X	X		X	X	X	X	X	
3	MW19	Feb 23, 2018		Water	S18-Fe27715	X	X	X		X	X	X	X	X	
4	RINS_0223	Feb 23, 2018		Water	S18-Fe27716					X	X	X	X	X	
5	TS	Feb 23, 2018		Water	S18-Fe27717										X
6	SB	Feb 23, 2018		Water	S18-Fe27718										X
7	QC20180223	Feb 23, 2018		Water	S18-Fe27719	X	X	X		X	X	X	X	X	
8	MW01	Feb 23, 2018		Water (Trace)	S18-Fe27756				X						
9	MW07	Feb 23, 2018		Water (Trace)	S18-Fe27757				X						

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Contact Name: Daniel Denaro

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Conductivity (at 25°C)	pH (at 25°C)	Total Alkalinity (as CaCO3)	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Metals M8 filtered	BTEX	Volatile Organics	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217															
Brisbane Laboratory - NATA Site # 20794															
Perth Laboratory - NATA Site # 23736															
10	MW19	Feb 23, 2018		Water (Trace)	S18-Fe27758				X						
11	RINS_0223	Feb 23, 2018		Water (Trace)	S18-Fe27759				X						
12	QC20180223	Feb 23, 2018		Water (Trace)	S18-Fe27760				X						
Test Counts						4	4	4	5	5	5	5	5	5	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.

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

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

Units

mg/kg: milligrams per kilogram

ug/L: micrograms per litre

ppb: Parts per billion

org/100mL: Organisms per 100 millilitres

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

mg/L: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

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

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.00005			0.00005	Pass	
Acenaphthylene	mg/L	< 0.00005			0.00005	Pass	
Anthracene	mg/L	< 0.00004			0.00004	Pass	
Benz(a)anthracene	mg/L	< 0.00005			0.00005	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00005			0.00005	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00005			0.00005	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00005			0.00005	Pass	
Chrysene	mg/L	< 0.00005			0.00005	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00005			0.00005	Pass	
Fluoranthene	mg/L	< 0.00005			0.00005	Pass	
Fluorene	mg/L	< 0.00005			0.00005	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00005			0.00005	Pass	
Naphthalene	mg/L	< 0.00005			0.00005	Pass	
Phenanthrene	mg/L	< 0.00005			0.00005	Pass	
Pyrene	mg/L	< 0.00005			0.00005	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	101			70-130	Pass	
TRH C6-C10	%	118			70-130	Pass	
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	119			70-130	Pass	
TRH C10-C14	%	88			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	99			70-130	Pass	
1.1.1-Trichloroethane	%	106			70-130	Pass	
1.2-Dichlorobenzene	%	93			70-130	Pass	
1.2-Dichloroethane	%	118			70-130	Pass	
Trichloroethene	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	80			70-130	Pass	
Acenaphthylene	%	86			70-130	Pass	
Anthracene	%	74			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	
Benzo(b&j)fluoranthene	%	101			70-130	Pass	
Benzo(g.h.i)perylene	%	97			70-130	Pass	
Benzo(k)fluoranthene	%	105			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a.h)anthracene	%	78			70-130	Pass	
Fluoranthene	%	95			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluorene	%	79			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	104			70-130	Pass	
Naphthalene	%	93			70-130	Pass	
Phenanthrene	%	85			70-130	Pass	
Pyrene	%	94			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	122			70-130	Pass	
4.4'-DDD	%	117			70-130	Pass	
4.4'-DDE	%	99			70-130	Pass	
4.4'-DDT	%	124			70-130	Pass	
a-BHC	%	90			70-130	Pass	
Aldrin	%	89			70-130	Pass	
b-BHC	%	92			70-130	Pass	
d-BHC	%	106			70-130	Pass	
Dieldrin	%	94			70-130	Pass	
Endosulfan I	%	100			70-130	Pass	
Endosulfan II	%	103			70-130	Pass	
Endosulfan sulphate	%	116			70-130	Pass	
Endrin	%	125			70-130	Pass	
Endrin aldehyde	%	123			70-130	Pass	
Endrin ketone	%	127			70-130	Pass	
g-BHC (Lindane)	%	91			70-130	Pass	
Heptachlor	%	126			70-130	Pass	
Heptachlor epoxide	%	86			70-130	Pass	
Hexachlorobenzene	%	109			70-130	Pass	
Methoxychlor	%	118			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	93			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	120			80-120	Pass	
Cadmium (filtered)	%	102			80-120	Pass	
Chromium (filtered)	%	113			80-120	Pass	
Copper (filtered)	%	106			80-120	Pass	
Lead (filtered)	%	101			80-120	Pass	
Mercury (filtered)	%	103			70-130	Pass	
Nickel (filtered)	%	108			80-120	Pass	
Zinc (filtered)	%	119			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Fe27836	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Fe27836	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M18-Fe28627	NCP	%	84			70-130	Pass	
4.4'-DDD	M18-Fe28627	NCP	%	126			70-130	Pass	
4.4'-DDE	M18-Fe28627	NCP	%	76			70-130	Pass	
4.4'-DDT	M18-Fe28627	NCP	%	118			70-130	Pass	
a-BHC	M18-Fe28627	NCP	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aldrin	M18-Fe28627	NCP	%	77			70-130	Pass	
b-BHC	M18-Fe28627	NCP	%	92			70-130	Pass	
d-BHC	M18-Fe28627	NCP	%	89			70-130	Pass	
Dieldrin	M18-Fe28627	NCP	%	88			70-130	Pass	
Endosulfan I	M18-Fe28627	NCP	%	88			70-130	Pass	
Endosulfan II	M18-Fe28627	NCP	%	106			70-130	Pass	
Endosulfan sulphate	M18-Fe28627	NCP	%	108			70-130	Pass	
Endrin	M18-Fe28627	NCP	%	129			70-130	Pass	
Endrin aldehyde	M18-Fe28627	NCP	%	106			70-130	Pass	
Endrin ketone	M18-Fe28561	NCP	%	102			70-130	Pass	
g-BHC (Lindane)	M18-Fe28627	NCP	%	80			70-130	Pass	
Heptachlor	M18-Fe28627	NCP	%	108			70-130	Pass	
Heptachlor epoxide	M18-Fe28627	NCP	%	95			70-130	Pass	
Hexachlorobenzene	M18-Fe28627	NCP	%	77			70-130	Pass	
Methoxychlor	M18-Fe28627	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Alkalinity (speciated)				Result 1					
Total Alkalinity (as CaCO3)	P18-Fe28065	NCP	%	55			70-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M18-Fe29085	NCP	%	113			70-130	Pass	
Cadmium (filtered)	M18-Fe29085	NCP	%	81			70-130	Pass	
Chromium (filtered)	M18-Fe29085	NCP	%	94			70-130	Pass	
Copper (filtered)	M18-Fe29085	NCP	%	85			70-130	Pass	
Lead (filtered)	M18-Fe29085	NCP	%	87			70-130	Pass	
Mercury (filtered)	S18-Fe27364	NCP	%	97			70-130	Pass	
Nickel (filtered)	M18-Fe29085	NCP	%	87			70-130	Pass	
Zinc (filtered)	M18-Fe29085	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Naphthalene	M18-Fe28561	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-Fe27760	CP	%	71			70-130	Pass	
Acenaphthylene	S18-Fe27760	CP	%	77			70-130	Pass	
Anthracene	S18-Fe27760	CP	%	71			70-130	Pass	
Benz(a)anthracene	S18-Fe27760	CP	%	93			70-130	Pass	
Benzo(a)pyrene	S18-Fe27760	CP	%	70			70-130	Pass	
Benzo(b&j)fluoranthene	S18-Fe27760	CP	%	77			70-130	Pass	
Benzo(g.h.i)perylene	S18-Fe27760	CP	%	75			70-130	Pass	
Benzo(k)fluoranthene	S18-Fe27760	CP	%	89			70-130	Pass	
Chrysene	S18-Fe27760	CP	%	72			70-130	Pass	
Dibenz(a.h)anthracene	S18-Fe27760	CP	%	96			70-130	Pass	
Fluoranthene	S18-Fe27760	CP	%	94			70-130	Pass	
Fluorene	S18-Fe27760	CP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-Fe27760	CP	%	91			70-130	Pass	
Phenanthrene	S18-Fe27760	CP	%	77			70-130	Pass	
Pyrene	S18-Fe27760	CP	%	90			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M18-Fe27835	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M18-Fe27835	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M18-Fe27835	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M18-Fe27835	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M18-Fe27835	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M18-Fe27835	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Propanone (Acetone)	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Chlorotoluene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Allyl chloride	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromoform	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon disulfide	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon Tetrachloride	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroform	M18-Fe27560	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iodomethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methylene Chloride	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Styrene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Vinyl chloride	M18-Fe27560	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M18-Fe29085	NCP	mg/L	0.002	0.002	7.0	30%	Pass	
Cadmium (filtered)	M18-Fe29085	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M18-Fe29085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M18-Fe29085	NCP	mg/L	0.013	0.013	<1	30%	Pass	
Lead (filtered)	M18-Fe29085	NCP	mg/L	0.002	0.002	2.0	30%	Pass	
Mercury (filtered)	M18-Fe29085	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M18-Fe29085	NCP	mg/L	0.030	0.029	2.0	30%	Pass	
Zinc (filtered)	M18-Fe29085	NCP	mg/L	0.14	0.14	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (at 25°C)	S18-Fe27715	CP	uS/cm	450	450	<1	30%	Pass	
pH (at 25°C)	S18-Fe27715	CP	pH Units	6.9	6.9	pass	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Total Alkalinity (as CaCO3)	S18-Fe27715	CP	mg/L	140	130	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S18-Fe27718	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S18-Fe27718	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S18-Fe27718	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S18-Fe27718	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S18-Fe27718	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S18-Fe27718	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S18-Fe27718	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S18-Fe27718	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S18-Fe27718	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Acenaphthylene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Anthracene	S18-Fe27757	CP	mg/L	< 0.00004	< 0.00004	<1	30%	Pass	
Benz(a)anthracene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benzo(a)pyrene	S18-Fe27757	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benzo(k)fluoranthene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Chrysene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Fluoranthene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Fluorene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Naphthalene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Phenanthrene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Pyrene	S18-Fe27757	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S18-Fe27757	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
a-BHC	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	S18-Fe27757	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Toxaphene	S18-Fe27757	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

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

Comments

Qualifier Codes/Comments

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

Authorised By

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

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Client: JBSG	**Client Project Name / Number / Site etc (ie report title):** 54393 WEST PENRITH HILLS
Contact Person: K. YEUNG	
Project Mgr: D. DENARO	**PO No.:**
Sampler: KY	**Envirolab Quote No. :**
Address:	**Date results required:** Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: **Mob:**	**Additional report format: esdat / equis /**
Email: kyeung@jbsg.com.au ddenaro@jbsg.com.au	**Lab Comments:**

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
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Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
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Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
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Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Sample information					Tests Required														Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	TRH/BTEX	VOC	OCP	8 metals	PAH (10 levels)										Provide as much information about the sample as you can
1	QA20180223	-	23/2/18	WATER	X	X	X	X	X										

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 185885
Date Received: 23/2/2018
Time Received: 15.20
Received by: PR
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None 1.2

Relinquished by (Company):		**Received by (Company):** ENS	**Lab Use Only**
Print Name: K. YEUNG		**Print Name:** P.Ray	**Job number:** / **Cooling: Ice / Ice pack / None**
Date & Time: 23/2/18		**Date & Time:** 23/2/2018 15:20	**Temperature:** / **Security seal: Intact / Broken /None**
Signature:		**Signature:** PR	**TAT Req - SAME day / 1 / 2 / 3 / 4 / STD**

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

TAX INVOICE

JBS & G Australia Pty Ltd
Level 1, 50 Margaret St
Sydney NSW 2000
Attention: Grace Ng

Invoice No: **SY 511702**
Invoicing Date: 01/03/2018
Payment Due Date: 31/03/2018

Project Details

Project No. and Description	54393, West Pennant Hills
Envirolab Report Number	185885
Purchase Order Number	

Testing Performed / Description of Service

	Unit Cost	Qty	Total Cost
VOC's in water	$75.00	1	$75.00
vTRH & BTEX in Water NEPM	$29.00	1	$29.00
TRH Water(C10-C40) NEPM draft	$29.00	1	$29.00
PAHs in Water - Low Level	$42.00	1	$42.00
OC Pesticides in water	$42.00	1	$42.00
8 HM in water - dissolved	$28.00	1	$28.00
Admin Fee	$25.00	1	$25.00
Invoice and GST Summary Details	**Total Amount:**		$270.00
	GST (10%):		$27.00
	Total Invoice Amount:		**$297.00**

Invoice Payment Options

Please Make Cheques Payable To	Envirolab Services Pty Ltd			
Please EFT To	*Account Name:*	Envirolab Services		
	NAB Swift Code:	NATAAU3303M		
	Bank:	National Australia Bank	*Branch:*	Marrickville NSW
	BSB:	082 356	*Account No:*	57981 3018
Remittance Advices To	*Fax No:*	02 9910 6299		
	Email:	accounts@envirolab.com.au		

VISA and Mastercard are accepted

PLEASE NOTE: OUR PAYMENT TERMS ARE STRICTLY 30 DAYS FROM DATE OF INVOICE

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 185885

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Daniel Denaro, Administration Email, Kiu Yeung
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**54393, West Pennant Hills**
Number of Samples	1 Water
Date samples received	23/02/2018
Date completed instructions received	23/02/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	02/03/2018
Date of Issue	01/03/2018

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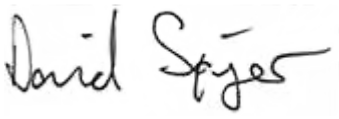
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Jaimie Loa-Kum-Cheung, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Steven Luong, Senior Chemist

Authorised By



David Springer, General Manager

VOCs in water		
Our Reference		185885-1
Your Reference	UNITS	QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date extracted	-	26/02/2018
Date analysed	-	27/02/2018
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	27
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	12
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	3
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1

VOCs in water		
Our Reference		185885-1
Your Reference	UNITS	QA20180223
Date Sampled		23/02/2018
Type of sample		Water
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	103
Surrogate toluene-d8	%	80
Surrogate 4-BFB	%	85

vTRH(C6-C10)/BTEXN in Water		
Our Reference		185885-1
Your Reference	UNITS	QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date extracted	-	26/02/2018
Date analysed	-	27/02/2018
TRH C_6 - C_9	µg/L	24
TRH C_6 - C_{10}	µg/L	27
TRH C_6 - C_{10} less BTEX (F1)	µg/L	27
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	103
Surrogate toluene-d8	%	80
Surrogate 4-BFB	%	85

svTRH (C10-C40) in Water		
Our Reference	UNITS	185885-1
Your Reference		QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date extracted	-	26/02/2018
Date analysed	-	27/02/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	80

PAHs in Water - Low Level		
Our Reference		185885-1
Your Reference	UNITS	QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date extracted	-	26/02/2018
Date analysed	-	27/02/2018
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	104

OCP in water		
Our Reference	UNITS	185885-1
Your Reference		QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date extracted	-	26/02/2018
Date analysed	-	26/02/2018
HCB	µg/L	<0.2
alpha-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
beta-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	89

HM in water - dissolved		
Our Reference		185885-1
Your Reference	UNITS	QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date prepared	-	26/02/2018
Date analysed	-	26/02/2018
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	2
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	2
Zinc-Dissolved	µg/L	23

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			26/02/2018	1	26/02/2018	27/02/2018		26/02/2018	[NT]
Date analysed	-			27/02/2018	1	27/02/2018	27/02/2018		27/02/2018	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	1	<10	<10	0	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	104	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	1	27	24	12	80	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	95	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	76	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Cyclohexane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	90	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	1	12	11	9	86	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	1	3	3	0	93	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	1	<1	<1	0	91	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	1	<2	<2	0	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
o-xylene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	95	1	103	94	9	106	[NT]
Surrogate toluene-d8	%		Org-013	97	1	80	98	20	115	[NT]
Surrogate 4-BFB	%		Org-013	90	1	85	91	7	97	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			26/02/2018	1	26/02/2018	27/02/2018		26/02/2018	[NT]
Date analysed	-			27/02/2018	1	27/02/2018	27/02/2018		27/02/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	1	24	24	0	84	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	1	27	25	8	84	[NT]
Benzene	µg/L	1	Org-016	<1	1	<1	<1	0	90	[NT]
Toluene	µg/L	1	Org-016	<1	1	<1	<1	0	92	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	1	<1	<1	0	78	[NT]
m+p-xylene	µg/L	2	Org-016	<2	1	<2	<2	0	79	[NT]
o-xylene	µg/L	1	Org-016	<1	1	<1	<1	0	79	[NT]
Naphthalene	µg/L	1	Org-013	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	95	1	103	94	9	106	[NT]
Surrogate toluene-d8	%		Org-016	97	1	80	98	20	115	[NT]
Surrogate 4-BFB	%		Org-016	90	1	85	91	7	97	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	26/02/2018	[NT]
Date analysed	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	27/02/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	130	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	88	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	80	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	13	[NT]
Surrogate o-Terphenyl	%		Org-003	74	[NT]	[NT]	[NT]	[NT]	123	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	26/02/2018	[NT]
Date analysed	-			27/02/2018	[NT]	[NT]	[NT]	[NT]	27/02/2018	[NT]
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	70	[NT]
Acenaphthylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	70	[NT]
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	77	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	26/02/2018	[NT]
Date analysed	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	26/02/2018	[NT]
HCB	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
gamma-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	98	[NT]
Heptachlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	106	[NT]
delta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	104	[NT]
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Dieldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	100	[NT]
pp-DDD	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	128	[NT]
Endosulfan II	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	101	[NT]
Methoxychlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	77	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	26/02/2018	[NT]
Date analysed	-			26/02/2018	[NT]	[NT]	[NT]	[NT]	26/02/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	98	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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CERTIFICATE OF ANALYSIS 185885-A

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Daniel Denaro
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**54393, West Pennant Hills**
Number of Samples	Additional Testing on 1 Water
Date samples received	23/02/2018
Date completed instructions received	26/02/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	01/03/2018
Date of Issue	28/02/2018

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Results Approved By
Nick Sarlamis, Inorganics Supervisor

Authorised By

David Springer, General Manager

Miscellaneous Inorganics		
Our Reference		185885-A-1
Your Reference	UNITS	QA20180223
Date Sampled		23/02/2018
Type of sample		Water
Date prepared	-	27/02/2018
Date analysed	-	27/02/2018
pH	pH Units	6.2
Electrical Conductivity	µS/cm	270
Total Alkalinity as $CaCO_3$	mg/L	41

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			27/02/2018	[NT]	[NT]	[NT]	[NT]	27/02/2018	[NT]
Date analysed	-			27/02/2018	[NT]	[NT]	[NT]	[NT]	27/02/2018	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	96	[NT]

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