Document 1

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Preliminary PFAS Risk Assessment for Camden Airport

Sydney Metro Airports

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Contents

Executive Summary

Sydney Metro Airports (SMA), the lease holder and operator of Bankstown and Camden Airports, engaged Jacobs to undertake a preliminary risk assessment of per- and polyfluoroalkyl substances (PFAS) land contamination at Camden Airport (the Airport). This report presents the scope of work, findings and recommendations from the risk assessment.

PFAS are a large group of compounds consisting of a fully fluorinated hydrophobic alkyl chain of varying length (typically 4 to 16 carbon atoms) and a hydrophilic end group. In the past, PFAS were often referred to as “PFCs” (per- and polyfluorinated chemicals). However the term PFAS is now used by regulators in Australia. PFAS are emerging contaminants and their sources, fate and transport and toxicity is still not well understood. Similarly, the regulatory framework for the characterisation, assessment and management of risks associated with PFAS is also under development.

No known sources of PFAS contamination have been identified at the Airport as part of this preliminary risk assessment. Aqueous Film Forming Foam (AFFF) used for fire fighting and fire fighting training is a significant source of PFAS contamination at airports in Australia. However information from Airservices Australia indicated that the Aviation Rescue and Fire Fighting (ARFF) service at Camden Airport ceased in around 1977 and no AFFF containing PFAS was used. Information from the NSW Rural Fire Service and NSW Fire & Rescue did not identify any incidents at the Airport where foam was applied.

No PFAS investigations of soil or groundwater have been undertaken at the Airport. Surface water sampling undertaken by SMA in February, 2016 identified low level concentrations of PFOS (0.06 µg/L and 0.26 µg/L) in two samples collected from an open drain close to the Helicopter Landing Site. It is noted that these samples were collected during dry conditions. Potential sources of PFAS that may have contributed to these concentrations include undocumented storage or use of AFFF, aviation hydraulic fluid, use of foam fire extinguishers, use of fire appliances that contained foam and off-site sources. Based on these two sample results alone, the site would be a Priority 2 site under the NSW EPA Decision Tree for prioritising sites potentially impacted with PFAS. The NSW EPA Decision Tree states that Priority 2 sites are to be further investigated once investigations at Priority 1 sites are completed.

There is no known beneficial use of groundwater at or in the near vicinity of the Airport. Groundwater from the Airport likely discharges to the Nepean River and therefore risks to beneficial users of groundwater on the opposite side of the Nepean River are considered to be low.

The Draft Australian and New Zealand Water Quality Guidelines for ecological impacts associated with PFOS in freshwater range from 0.00023 µg/L for high conservation value ecosystems (99% species protection) to 31 µg/L for highly disturbed ecosystems (80% species protection). It is likely that the guideline value for slightly to moderately disturbed ecosystems (PFOS concentration of 0.13 µg/L) would apply for the Nepean River based on general guidance issued by the NSW Government (NSW DEC, 2006).

Therefore, the potential for surface water containing PFAS from the Airport to discharge to the Nepean River and impact on aquatic ecosystems is likely the most significant source – receptor pathway identified in this preliminary risk assessment. In order to further assess this risk, it is recommended that SMA undertakes the following:

1) **Survey of the surface water drainage network at the Airport**. This should include identification of surface water drainage structures, potential overland flow paths and discharge points to the Nepean River.

1) **Upgrade to the current surface water quality monitoring program.** Once the survey of the surface water drainage network has been completed, a review of the surface water sampling locations should be undertaken. These should include sampling locations in the Nepean River upgradient, of the Airport discharge points, at the discharge points and downgradient of the discharge points. The analysis suite should also be upgraded to include a more comprehensive suite of PFAS compounds. As a minimum, perfluorohexane sulfonic acid (PFHxS) should be included in all future PFAS analysis.

2) **GEMS 002 PFC – management actions advice**. For the purposes of GEMS 002, this Preliminary PFAS Risk Assessment could be used as a Trigger Assessment for new activities at the Airport. The risk of

significant PFAS contamination to be present at the Airport is considered low and further investigation is not considered necessary. However, should a detailed site investigation be undertaken for other reasons (ie. potential presence of non-PFAS contaminants) then it is recommended that PFAS compounds are included in the laboratory analysis suites. Additional data on PFAS concentrations in soil, groundwater or surface water at the Airport should be compiled to support updates to the Conceptual Site Model and revisions of the risk assessment in the future.

Important note about your report

The sole purpose of this report is to present the findings of a Preliminary Per- and Polyfluoroalkyl Substances Risk Assessment at Camden Airport carried out by Jacobs for Sydney Metro Airports ('the Client'). This report was produced in accordance with and is limited to the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

The scope of services was not intended to provide a definitive or quantitative investigation of the environmental impacts, performance and compliance of the subject site. Environmental conditions may exist at the site that are beyond the scope of our investigations and this report.

The findings presented in this report are professional opinions based solely upon information and data provided or made available by the Client or otherwise available in the public domain between 28 May, 2016 and 9 January, 2017.

Jacobs has relied upon and presumed that this data is accurate and representative of the conditions at the site. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete or if site conditions change beyond the above dates then it is possible that our conclusions as expressed this report may change. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable at the time of this report may in the future become subject to different regulatory standards and require assessment.

Opinions and judgements expressed in the report are based on Jacobs' understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

Except as specifically stated in this report, Jacobs makes no statement or representation of any kind concerning the suitability of the site for any purpose or the permissibility of any use.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of the Client, and is subject to and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

Sydney Metro Airports (SMA), the lease holder and operator of Bankstown and Camden Airports, has engaged Jacobs Group (Australia) Pty Ltd (Jacobs) to undertake a preliminary risk assessment of per- and polyfluoroalkyl substances (PFAS) land contamination at Camden Airport (the Airport). The Airport property is owned by the Commonwealth. The management of environmental matters on the Airport is regulated under the *Airports Act 1996* and the *Airports (Environment Protection) Regulations 1997*.

This report presents the scope of work, findings and recommendations from the preliminary risk assessment.

1.1 Scope of work

The preliminary risk assessment was limited to:

- An assessment of the potential for PFAS to be present in soil, groundwater or surface water at the Airport; and,
- An assessment of whether PFAS in soil, groundwater or surface water, if present, could present a risk to human health or the environment.

The scope of work involved a desktop assessment and brief site reconnaissance only. No environmental sampling was undertaken as part of this assessment.

The scope of work performed included:

- Identification of potential sources of PFAS at the Airport through a review of SMA and tenant activities and submission of information requests to the Department of Infrastructure and Regional Development (DIRD), Airservices Australia, NSW Rural Fire Service and the NSW Fire & Rescue.
- A review of the Airport site setting including topography, geology, hydrogeology and hydrology to identify potential PFAS transport pathways.
- Identification of potential receptors to PFAS contamination including on-site and off-site human receptors and on-site and off-site ecological receptors.
- Review of existing soil, groundwater and surface water data at the Airport relating to PFAS contamination.
- Development of a preliminary conceptual site model and a qualitative assessment of PFAS risks.
- Recommendations for further investigation and / or risk management measures as appropriate.

2. Background on Per- and Polyfluoroalkyl substances (PFAS)

2.1 Terminology

PFAS are a large group of compounds consisting of a fully fluorinated hydrophobic alkyl chain of varying length (typically 4 to 16 carbon atoms) and a hydrophilic end group (DER, 2016). In the past, PFAS were often referred to as “PFCs” (per- and polyfluorinated chemicals), but this term can also be understood as perfluorocarbons which contain only carbon and fluorine and have properties and functionalities different from those of PFAS (OECD, 2013).

PFAS and their derivatives are man-made chemicals and have been used in a wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware (although not added to the finished cookware), specialised garments and textiles, Scotchgard™ and similar products (used to protect fabric, furniture, and carpets from stains), metal plating and in some types of fire-fighting foam (NICNAS, 2016).

There are two main groups of PFAS used in industry (NICNAS, 2016):

- perfluoroalkyl sulfonic acids (PFSA) group, including chemicals such as perfluorooctane sulfonate (PFOS)
- the perfluorocarboxylic acid (PFCA) group, including chemicals such as perfluorooctanoic acid (PFOA).

Various organisations have used the term PFCs in the past. However, the US EPA is now utilising the term PFAS to collectively describe PFOA, PFOS and the other chemicals in these groups (US EPA, 2016). The Environmental Health Standing Committee of the Australian Health Protection Principal Committee (enHealth) now refers to this group of chemicals as PFAS (enHealth, 2016) and other Australian regulatory authorities appear to be following this direction.

2.2 Sources of PFAS

PFAS are man made chemicals that have been used since the 1950s. They are resistant to heat, oil, grease, water and acids and this, combined with their surfactant properties, have made them useful for a wide variety of applications.

While PFAS has not been manufactured in Australia, PFOS was a component of the Scotchgard™ and Scotchban™ range of products supplied by the 3M Company. Scotchgard™ was used in commercial / industrial applications in Australia for protecting textiles and leather. Scotchban™ was used to treat paper containers for fast-food and pet-food. Other products containing PFAS that were used in Australia include Aqueous Film Forming fire fighting Foams (AFFF) and Alcohol-Type Concentrate (ATC) fire fighting foams, industrial coating products, rubber moulding products and acid mist suppressants. (NICNAS, 2013)

The salts of PFSAs (primarily PFOS) have been used as additives with a content of about or less than 0.1% in aviation hydraulic fluids to prevent evaporation, fires and corrosion (OECD, 2013).

Non-polymeric PFAS (such as the potassium, lithium, diethanolamine and ammonium salts of PFOS or 6:2 fluorotelomer sulfonate) have been used as surfactants, wetting agents and mist suppressing agents for both decorative chrome plating and hard chrome plating processes. Recent technology development on using chromium (III) instead of chromium (VI) has made PFOS use in decorative chrome plating obsolete. For hard plating, chromium (III) does not work, and PFOS is still used for this application (OECD, 2013).

The 3M Company stopped manufacturing PFOS chemicals in December 2000 and reformulated all Scotchgard products replacing PFOS with other short-chain PFASs (NICNAS, 2016). Many PFOS containing products were phased out in Australia in December, 2013 (NICNAS, 2013). However in many cases, products containing the C-8 chain PFAS such as PFOS and PFOA have been replaced by products with shorter chain PFAS. For example manufacturers of aqueous film forming foams AFFF have been replacing long-chain fluorosurfactants based on PFOS or PFOA derivatives/precursors with shorter-chain fluorosurfactants based on perfluorobutane sulfonate (PFBS) and perfluorohexane sulfonic acid (PFHxS) (Danish Environmental Protection Agency, 2015).

2.3 Fate and transport

PFAS includes thousands of compounds and the fate and transport of these compounds in the environment is not well understood. In general terms, PFAS are known to be persistent, bioaccumulative and toxic and, due to their persistence in the environment and moderate solubility, can be transported long distances (potentially kilometres) in water and air, and transfer between different media (e.g. soil, sediment, surface water and groundwater) (DER, 2016).

Over the pH range normally found in soil, groundwater and surface waters (pH 5-9) PFAS are normally present as anions, and this reduces sorption by soils and sediments, which usually carry a net negative charge. Their retardation during transport in groundwater increases with perfluorocarbon chain length and the fraction of organic carbon in the soil, with PFSAs binding more strongly than PFCAs of the same carbon number. Vapour migration plays only a minor role in assessing the mobility of most PFAS in the environment due to the low to very low vapour pressure of the PFAS. (Concawe, 2016)

While PFAS are generally considered to be recalcitrant to biodegradation via naturally-occurring microorganisms in water or soil, precursors are known to be transformed into PFAS under natural circumstances (Concawe, 2016). Therefore, DER (2016) recommends that the potential for precursor transformation to PFOS and PFOA and other PFAS metabolites should be considered in the overall potential for environmental and human exposure and evaluation of risk to human health, the environment and environmental values when assessing site contamination caused by PFAS.

2.4 Exposure and toxicity

enHealth (2016) notes that because of their widespread use, most people in Australia will have some PFOS and PFOA in their body. PFOS and PFOA are readily absorbed through the gut, and once these chemicals are in a person’s body it takes about two to nine years, depending on the study, before those levels go down by half, even if no more is taken in. Outside of the occupational setting, exposure to PFAS can occur from the air, indoor dust, food, water and various consumer products. For most people food is expected to be the primary source of exposure to PFOS and PFOA. Human breast milk may contribute to exposure in infants since PFCs have been detected in human breast milk. For some communities near facilities where PFOS and PFOA have been extensively used, higher levels may be found in the surrounding environment and exposure may occur through other means, including drinking water supplied from groundwater containing PFOS and PFOA..

Studies on laboratory animals exposed to high levels of PFAS have indicated changes in the liver, thyroid, and pancreatic function, as well as some changes in hormone levels. Some, but not all studies in humans have shown that certain PFAS may:

- affect the developing foetus and child, including possible changes in growth, learning, and behaviour;
- decrease fertility and interfere with the body’s natural hormones;
- increase cholesterol;
- affect the immune system; and
- increase cancer risk. (ATSDR, 2016)

As noted in Section 2.2, many products containing C-8 chain PFAS have been replaced by shorter chain PFAS. While these are thought to be less toxic, there is a general lack of toxicological information regarding the short-chain PFAS other than PFHxS. Similarly there is very little information on the environmental fate and transport of short-chain PFAS. (Danish Environmental Protection Agency, 2015).

2.5 Regulatory framework

Regulators around the world have introduced restrictions on the manufacture, import and use of certain types of PFAS since the early 2000’s. As noted in Section 2.2, many types of PFOS containing products were prohibited in Australia from 2003.

However the Commonwealth and State regulatory framework for the management of PFAS impacts to land is still developing. There are no screening guideline values for PFAS included in the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 (NEPM). There are no specific published NSW EPA guidelines or requirements for the assessment of PFAS impacts or for the disposal of PFAS impacted waste in NSW. The *Airports (Environment Protection) Regulation 1997* does not provide trigger levels for PFAS in soil or groundwater.

In May, 2015, the Department of Defence issued Interim Screening Criteria for Perfluorooctanesulfonate (PFOS), Perfluorooctanesulfonic acid (PFOA) and 6:2 fluorotelomer sulfonate (6:2FTS) (Defence, 2015). These compounds are PFAS that are commonly present in certain types of AFFF.

In March, 2015, the Department of Infrastructure and Regional Development published the Guideline for Environmental Management 002 “PFC – management actions advice” (GEM 002) (DIRD, 2015). This document is discussed further in Section 2.5.1.

In June, 2015, Airservices Australia commissioned GHD to prepare the report “Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework” (GHD, 2015) which also provides background on the potential presence, transport mechanisms and risks associated with PFAS and presented a recommended management strategy for PFAS impacted land.

The Western Australian Department of Environmental Regulation published “Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Contaminated Sites Guidelines” in February, 2016 (DER, 2016). This document provides recommendations on the assessment, management and remediation of PFAS impacted sites.

enHealth published “Interim national guidance on human health reference values for per- and poly-fluoroalkyl substances for use in site investigations in Australia” in June, 2016 (enHealth, 2016). This guidance provides recommended Tolerable Daily Intake values, Drinking Water Quality Guidelines values and Recreational Water Quality Guideline values for the sum of PFOS and perfluorohexane sulfonate (PFHxS) as well as PFOA.

The QLD Department of Environment and Heritage Protection published the “Operational Policy for the Environmental Management of Fire Fighting Foam” in July, 2016 (DEHP, 2016). This policy sets out requirements for fire fighting foams or materials contaminated with fire fighting foams in Queensland. Under this policy, foams containing PFOS or PFOA and it’s precursors must be withdrawn from service. C6 chain flourotelemer foams can be used under certain conditions.

A summary of published guideline values for PFAS in soil, surface water and groundwater is provided in Table 1 on the following page.

Table 1 : Summary of selected Australian PFAS guideline values

Exposure scenario	PFOS	PFOS + PFHxS	PFOA	6:2 FTS
Tolerable Daily Intake (µg/kg/d)		0.15[1]	1.5[1]	
Drinking Water Quality Guideline (µg/L)	0.2[2,5,6]	0.5[1]	5[1] 0.4[2,5,6]	5[2,5,6]
Recreational Water Quality Guideline (µg/L)	2[6]	5[1]	50[1] 4[6]	50[6]
Ecological – freshwater (High conservation value – 99% species protection) (µg/L)	0.00023[3]		19[3]	
Ecological – freshwater (Slightly – moderately disturbed ecosystems – 95% species protection) (µg/L)	0.13[3] 6.66[5,6]		220[3] 2900[5,6]	
Ecological – freshwater (Highly disturbed ecosystems – 90% species protection) (µg/L)	2[3]		632[3]	
Ecological – freshwater (Highly disturbed ecosystems – 80% species protection) (µg/L)	31[3]		1,824[3]	
Soil – human health residential (mg/kg)	4[4] 6[5,6]		16[5,6]	60[5,6]
Soil – human health industrial / commercial (mg/kg)	100[4] 90[5,6]		240[5,6]	900[5,6]
Soil – ecological terrestrial (mg/kg)	0.373 – 4.71[5,6]		3.73[5,6]	
Surface water – human health consumption of fish (ng/L)	0.65[5,6]		300[5,6]	6.5[5,6]

Sources:

[1] enHealth (2016)
[2] Defence (2016) based on US EPA provisional guidance.
[3] Draft Australian and New Zealand Water Quality Guidelines applicable to aquatic organisms as published in DER (2016)
[4] DER (2016)
[5] Airservices Australia Guidance (GHD 2015)
[6] Defence (2016) based on US EPA Region 4 guidance.

2.5.1 GEM 002 – PFC – management actions advice

GEM 002 – PFC Management Actions Advice (DIRD, 2016) provides a guide to operators of undertakings at federal leased airports on the reasonable and practicable management of PFAS which may be encountered during building activities. GEM 002 was applicable until 30 June, 2016 and SMA has been advised by DIRD that it should still be applied.

The guidance recommends that a Trigger Assessment is conducted to determine if there is a likelihood of known or potential PFAS contaminating activities occurring (presently or in the past) on or in the vicinity of the building activity site. If the Trigger Assessment identifies a likelihood of known or potential contamination then a Preliminary Site Investigation should be conducted as per Schedule A of the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended in 2013 (referred to as the NEPM) (NEPC, 2013).

Where the Preliminary Site Investigation indicates there is reason to expect PFAS contamination or there is not sufficient information to determine otherwise, then a Detailed Site Investigation should be conducted in accordance with Schedule A of the NEPM.

2.5.2 NSW EPA Decision Tree for Prioritising Sites Potentially Contaminated with PFASs

The NSW EPA commissioned Environmental Risk Sciences Pty Ltd (enRiskS) to prepare a decision tree for prioritising sites potentially contaminated with PFAS (hereafter referred to as the NSW EPA Decision Tree) (enRiskS, 2016). The NSW EPA Decision Tree states that an initial screening assessment involving collection of surface water, groundwater and soil samples is to be undertaken at each potentially impacted site, in the areas of the site most potentially impacted.

Trigger points have been defined based on total PFAS concentrations in the collected samples. Based on these trigger points, a site is classified as either one of the following priority levels:

- **Priority 1** sites where PFAS concentrations are elevated and there is a pathway by which people or the environment can be exposed to the contamination. Detailed investigations are to be carried out on these sites as soon as possible and short term management options to reduce the risks associated with the contamination may also be needed.
- **Priority 2** sites are those where PFAS is present above screening guidelines but at lower concentrations than Priority 1 sites. Detailed investigations of these sites are to be performed following the Priority 1 sites.
- **Priority 3** sites are those sites where PFAS concentrations are not detected or are detected below the relevant thresholds. These sites are unlikely to need further investigation but a final decision on the need for such an investigation is to be confirmed once the Australian guidelines for these chemicals are finalised.

The trigger point values are summarised in Table 2 below.

Table 2 : NSW EPA Decision Tree trigger point values (summarised from enRiskS, 2016)

Trigger point descriptor	Surface water	Groundwater	Soil leachate
Trigger Point 1 Elevated contamination	10 µg/L	10 µg/L	100 µg/L
Trigger Point 2 Current screening guideline	0.1 µg/L	0.1 µg/L	1 µg/L
Trigger Point 3 Low level of contamination	0.05 µg/L	0.05 µg/L	-
Limit of Reporting as at February, 2016	0.01-0.05 µg/L	0.01-0.05 µg/L	-

For surface water and groundwater samples, Priority 1 sites are those where on-site results are above Trigger Point 1 or where off-site results exceed Trigger Point 2. Priority 2 sites are those where on-site results are between Trigger Point 1 and Trigger Point 3 or off-site results are between Trigger Point 2 and Trigger Point 3. Priority 3 sites are those where on or off-site results are below Trigger Point 3.

For soil leachate samples, Priority 1 sites are those where results are above Trigger Point 1. Priority 2 sites are those with results between Trigger Point 1 and Trigger Point 2. Priority 3 sites are those with results below Trigger Point 2.

3. Site setting

3.1 Overview

The Airport consists of approximately 196 hectares of commonwealth land located approximately 60 km from the Sydney Central Business District (CBD). The Airport has four runways, two for powered fixed wing aircraft and two for gliders. One of the runways has a sealed asphalt surface while the other three runways are grass. There is also a designated Helicopter Landing Site in the northern area of the Airport. Approximately 34 hectares of land within the Airport property is leased to around 42 tenants. These tenants generally carry out commercial aviation, recreational aviation and rural activities. The NSW Rural Fire Service operates helicopters for emergency services during the bushfire season. There is one fuel service provider at the Airport, using a bowser system (SMA, 2015).

An aerial photo of the Airport and surrounding areas is provided as **Figure 1** below.

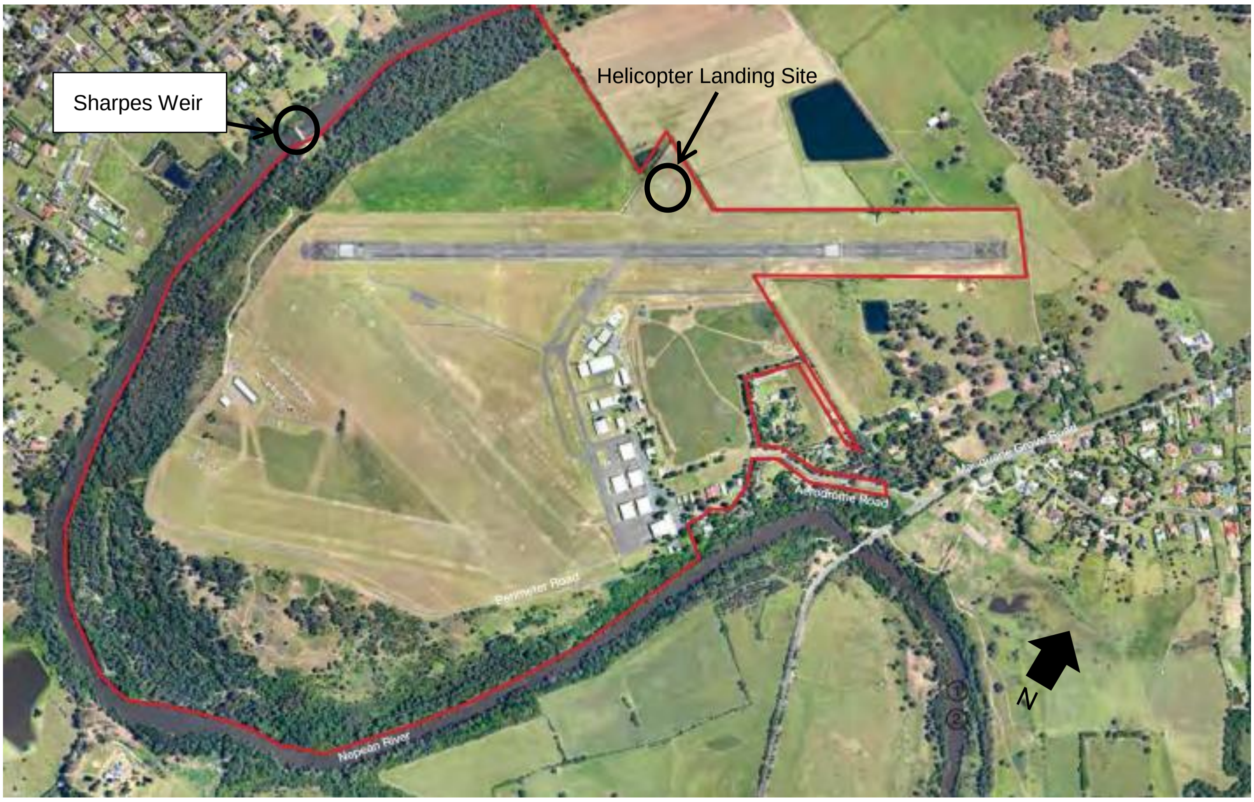


Figure 1 : Aerial photo of the Airport and surrounding area (source: SMA, 2015)

3.2 Surrounding properties

The Nepean River is located adjacent to the Airport's northern, western and southern boundaries. The land to the immediate east of the Airport and the land on the opposite side of the Nepean River can generally be classified as rural residential. The main agricultural activity is grazing.

3.3 Topography and hydrology

The Airport land is generally flat with an elevation of approximately 60 meters Australian Height Datum (AHD). The land in the east of the Airport property, where the main hangars and buildings are located is on slightly higher ground than the remainder of the property. Large parts of the Airport property fall within the 1 in 100 year flood zone.

Stormwater on the developed parts of the Airport property flows to drains and channels which then discharges at a single point to the Nepean River (SMA, 2013 and URS, 2000). Stormwater flows in the upper part of the property flow overland to the Nepean River (URS, 2000). There are currently no plans available which show the locations of drainage infrastructure and the discharge points to the Nepean River. A recommendation for SMA to obtain this information is included in Section 7.

The Nepean River is part of the Hawkesbury Nepean Catchment. There are a series of weirs along the Nepean River which partially regulate flow. Sharpes Weir is the only weir located directly adjacent to the Airport property (see Figure 1). While the upper Nepean River includes several dams for water supply purposes, the part of the river adjacent to and downstream of the Airport is not used for drinking water supply. However water from the river downstream of the Airport is used for agricultural and industrial purposes as well as recreational uses such as water sport and fishing.

Sydney Water operates the West Camden Sewage Treatment Plant approximately 800 meters south of the southern Airport property boundary. The treatment plant discharges to Matahil Creek which flows into the Nepean River opposite the Airport’s southern boundary.

3.4 Soils and geology

Review of the 1:100,000 Wollongong – Port Hacking Soil Landscape Series Sheet 9029-9129 (Soil Conservation Service of NSW, 1990) indicated that the area in which the Airport is located has soils primarily within the Theresa Park landscape grouping. This is noted to consist of tertiary and quaternary flloodplain and terraces of the Nepean River south of Cobbity Creek. Soils consist of Red Earths and Red Podzolic Soils on terraces and minimal Praire Soils on the current floodplain. Alluvial bedding is sometimes evident with Alluival Soils. In the drainage lines Solodic Soils occur. These soils are highly variable and include poorly structured orange to red silty loams, brown loams and sandy loams.

The eastern, more elevated area of the Airport property is noted as having soils in the Blacktown landscape group. Soils in this landscape are shallow to moderately deep Red Pozolic Soils and Brown Podzolic Soils on crests, upper slopes and well drained areas; deep Yellow Podzolic Soils and Soloths on lower slopes and in drainage depressions and localised areas of poor drainage.

Review of the 1:100,000 Wollongong – Port Hacking Geological Sheet 9029-9129 (Geological Survey of NSW, 1985) indicated the Airport is within an area underlain by quartz and lithic “fluvial” sand, silt and clay. The eastern portion of the Airport property is also noted to have high-level alluvium. These units overlie Bringelly Shale of the Wianamatta Group.

3.5 Hydrogeology

Regional groundwater flow at the Airport is expected to be towards the Nepean River. Shallow groundwater is expected to be perched above the residual weathered bedrock and to be recharged predominantly by the infiltration of surface water falling onto the unsealed surfaces of the site. There are several groundwater wells at the Airport. These were installed by Airport tenants with underground storage tanks for the purpose of monitoring for leaks (SMA, 2013). No further information on these wells and the depth to groundwater was made available to Jacobs.

3.5.1 Beneficial use of groundwater

SMA has advised that there is currently no beneficial use of groundwater at the Airport.

At the time of preparing this risk assessment, Jacobs conducted a search of the Office of Water groundwater database. There were no registered wells identified within the Airport property. Several registered wells were identified on the opposite side of the Nepean River. The two nearest wells to the north of the Airport (GW024355 and GW GW024356) are listed as being for exploration purposes. GW105789 to the west of the Airport is listed as being for domestic supply and stock watering. The information provided indicates that the well has a depth of 139 m and a standing water level of 39 m. GW027792 to the west of the Airport is listed as having an intended purpose of domestic use and an authorised purpose of industrial use. The well has a depth of 121.9 m. The standing water level was not provided.

The locations of the registered wells are shown on **Figure 2** below.

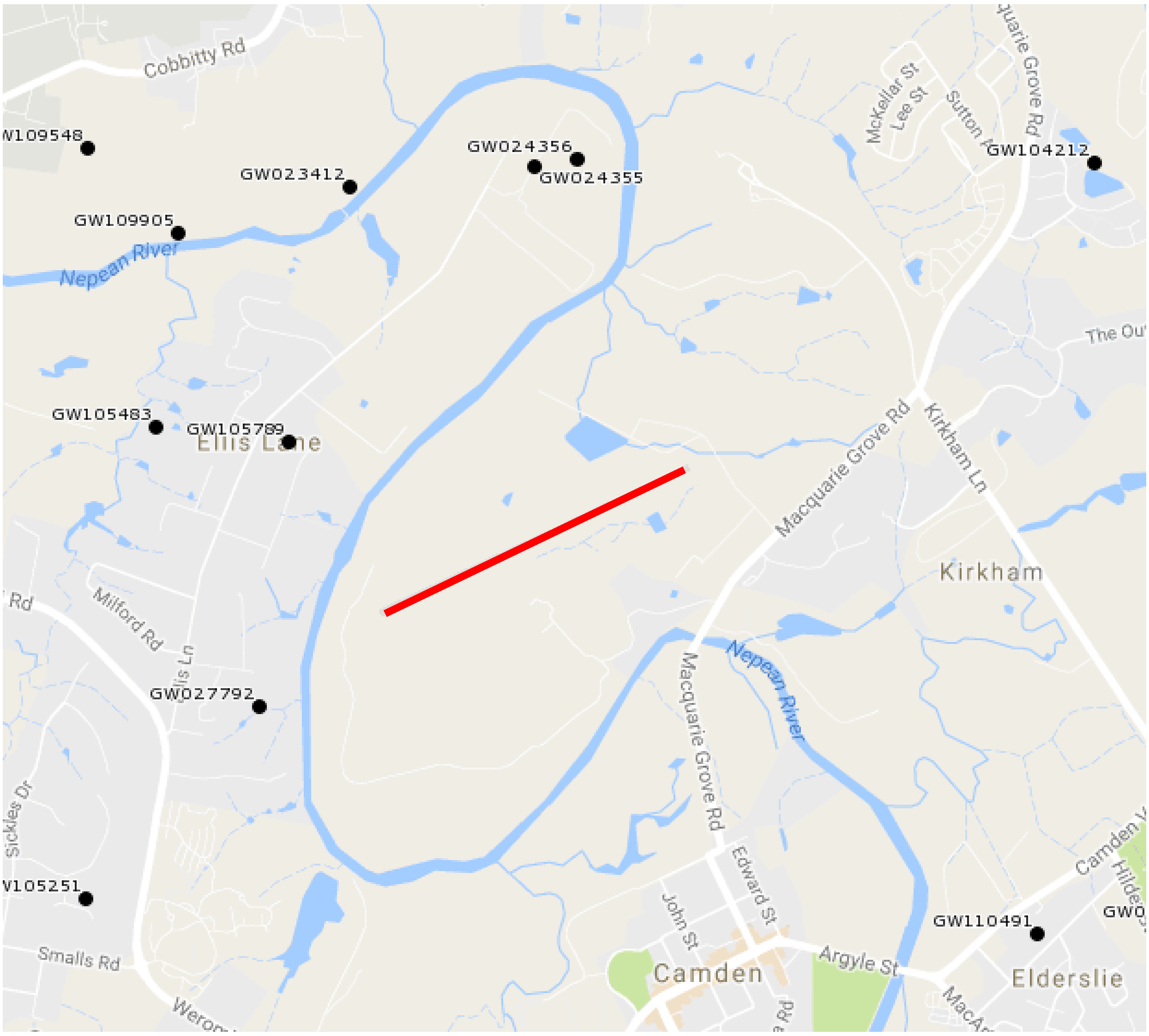


Figure 2 : Registered water bores around Camden Airport (Office of Water website search on 22 November, 2016). Red line indicates position of the main runway.

4. Potential sources of PFAS at the Airport

This section provides a historical overview of operations at the airport and the findings from our communications with the Department of Infrastructure and Regional Development (DIRD), Airservices Australia, the NSW Rural Fire Service and NSW Fire & Rescue.

4.1 Historical overview

The Airport was initially developed in 1935 as a private aerodrome on the property owned by the Macarthur-Onslow family. The Federal Government acquired the Airport during World War II and it was used for training, anti-submarine, convoy escort, reconnaissance, general air and meteorological roles. A large US Army Air Corp was based and barracked at the Airport (SMA, 2015).

The Department of Civil Aviation owned the Airport from 1946 to 1983 when the ownership was transferred to the Federal Airports Corporation. Ownership was then transferred to the Sydney Airports Corporation Limited (SACL) in 1998. Camden Airport Limited (CAL) was formed at this time and was wholly owned by SACL. SMA took control of CAL in 2003 (SMA, 2015).

4.2 Information from the Department of Infrastructure and Regional Development

A letter was sent to the Department of Infrastructure and Regional Development (DIRD) requesting information on historical activities at the Airport that may have involved the use or storage of PFAS containing materials. A response from DIRD (letter to Bankstown Airport Limited dated 23 September, 2016) stated that the historical files reviewed by DIRD did not identify the use of PFAS or specific locations which may be of interest.

4.3 Information from Airservices Australia

Jacobs contacted Airservices Australia (Airservices) to request information on the historic use and storage of AFFF at the Airport.

In an email response to Jacobs, Airservices advised that Airservices was created in 1995 and has not carried out an Aviation Rescue and Fire Fighting (ARFF) service at Camden Airport. It is Airservices’ understanding that the ARFF service ceased at Camden in around 1977, prior to the creation of the Civil Aviation Authority (CAA). Further, it is Airservices’ understanding that only non-fluorinated foam was used at Camden. This aligns with Airservices submission to the Senate Inquiry into Contamination at Commonwealth, State and Territory sites in Australia where Fire Fighting Foams containing Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) (Airservices, 2016).

Information provided by Airservices to Jacobs in 2010 indicated that there was no fire training ground at the Airport. However there was an ARFF fire station located in the northern part of the hangar area. Staffing of the fire station was restricted to weekends and AFFF was not used.

4.4 Information from the NSW Rural Fire Service

A request for information on the historical or current use of AFFF at the Airport was submitted to the NSW Rural Fire Service (NSW RFS). The NSW RFS responded in a letter to SMA dated 15 July 2016. In this response, NSW RFS stated that:

- NSW RFS historically used AFFF containing PFOS and PFOA. These foams were phased out with no further purchases from 2005 and a recall of all existing stocks in 2007.
- NSW RFS noted that AFFF, also known as Class B foams, were designed and are used for petrol and oil fires, not bush fires. Incidents that NSW RFS respond to seldom require Class B foam. However all NSW RFS appliances are equipped with Class B foam.

- Aircraft operating by or for NSW RFS from Camden Airport would not be loaded with AFFF but with foam products specifically targeted at bushfires, known as Class A foams. Class A foams do not contain PFOS or PFOA.
- The application of AFFF is a standard operational procedure in an aircraft incident involving the risk of fire. Records held by NSW RFS indicate a number of incidents involving aircraft prior to 2007, the majority off-site in surrounding suburbs such as Greendale, Oran Park, Ellis Lane and Cobbity. The only known incident at Camden Airport occurred on 11 May 2001, where a RAAF Caribou landed with one engine. Records do not indicate whether fire fighting foam was used in this incident.

4.5 Information from NSW Fire & Rescue

NSW Fire & Rescue was requested to provide information on fire incidents at the Airport, whether AFFF was used during these incidents and the approximate amount of AFFF applied.

In NSW Fire & Rescue's response, it was noted that computerised records of incidents are available from 1987 and AFFF was phased out by NSW Fire & Rescue in 2007. NSW Fire & Rescue advised that they did not respond to any incidents at Camden Airport during this period.

4.6 Australian Transport Safety Bureau incident investigations

Jacobs conducted a search of the Australian Transport Safety Bureau aviation safety investigations and reports database for all incidents at Camden Airport. A total of 34 incidents were identified, a number of which related to forced landings outside of the airport property (in some cases several kilometres from the Airport). The incident reports did not indicate whether fire services responded or whether foam was applied.

4.7 Information from SMA

SMA advised Jacobs that their records do not indicate any incidents at the Airport where AFFF may have been applied. No historical activities involving the storage or use of AFFF were identified.

4.8 Information from previous investigations

Jacobs reviewed the Contaminated Sites Register and associated reports for the Airport maintained by SMA. The purpose of this review was to identify potential PFAS sources at the Airport and soil, surface water or groundwater investigations where analysis of PFAS has been performed.

No potential PFAS sources were identified from this review. It is noted that URS (2000) reported the presence of a landfill in the western portion of the Airport property. This was estimated to be approximately 30 meters x 20 meters in area and was used to dispose of waste materials from the Airport. The waste material mainly comprised fibre-glass markers, empty drums, construction debris, wooden pallets and sundry waste materials. No waste oils or other similar organic materials were reportedly dumped in the landfill. The landfill area has been covered with fill material and revegetated. Based on the information available, Jacobs considers that the landfill is unlikely to be a significant source of PFAS.

4.9 Current activities

SMA were not aware of any activities at the Airport that use or store products known to contain PFAS.

There are a large number of aviation related activities undertaken by tenants at the Airport where aviation hydraulic fluid may be used and / or stored. Hydraulic fluid may also leak from aircraft in parking areas. As noted in Section 2, small amounts of PFAS (<0.1%) can be present in aviation hydraulic fluids.

5. Previous PFAS investigations

A review of previous investigations and monitoring reports was undertaken to identify studies where PFAS was included in the laboratory analysis. The only investigation identified which included PFAS analysis was the surface water sampling undertaken in February, 2016 (SMA, 2016).

A biannual surface water monitoring program is in place at the Airport as part of the Airport's Water Quality Management Plan (BAL, 2013). Surface water samples are collected from seven locations across the Airport property (see **Figure 3** below).

Figure 3 : Stormwater monitoring locations (SMA, 2016). Note: Red boxes indicate locations where PFAS was detected in the February, 2016 sampling round.

Surface water samples were collected from six location (CSW1 was dry) in February, 2016. The report noted that a total of 0.4 mm of rainfall was recorded at Camden Airport in the week preceding the date of the February sampling event. As such, it was not considered to be a wet weather sampling event.

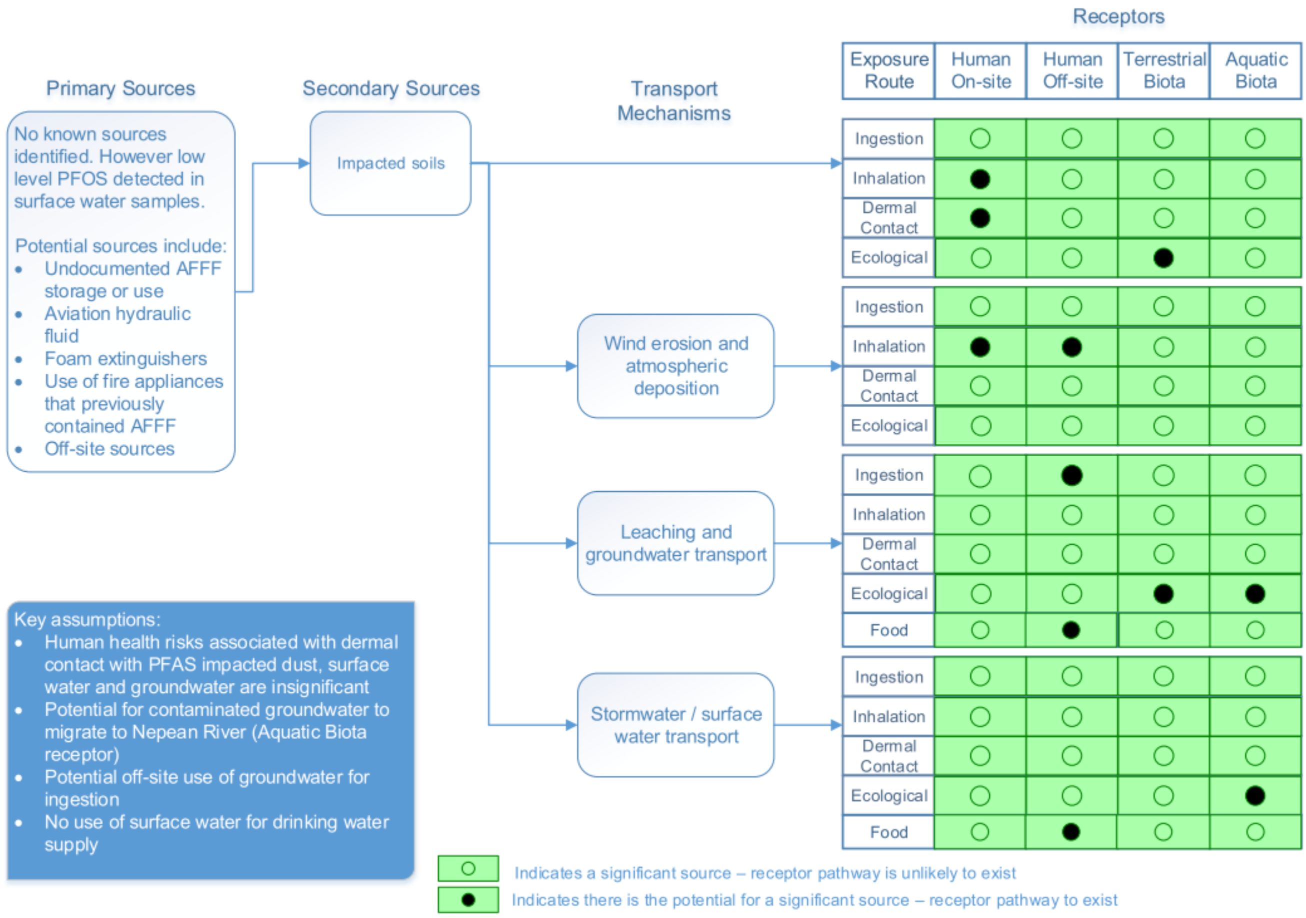
All samples were analysed for PFOS, PFOA, 6:2 Fluorotelomer sulfonate (6:2 FtS) and 8:2 Fluorotelomer sulfonate (8:2 FtS). PFOS concentrations above the laboratory limit of reporting were detected in samples from locations CSW-4 (0.06 µg/L) and CSW-5 (0.26 µg/L). These samples were collected from an open drain located close to the Helicopter Landing Site. The remaining PFAS analytes were below the laboratory limit of reporting at all locations.

In terms of the NSW EPA Decision Tree (see Section 2.5.2), based on a maximum reported concentration of PFOS in on-site surface water samples of 0.26 µg/L, the Airport would be classified as a Priority 2. However it is noted that the NSW EPA trigger points have been set for total PFAS.

6. Preliminary conceptual site model

A preliminary conceptual site model for the risks associated with PFAS contamination at the Airport has been developed. The purpose of a conceptual site model is to identify known or potential sources of contamination, human health and environmental receptors including exposure mechanisms and pathways between the sources and receptors. A risk is present where there is a complete source – pathway – receptor linkage. The conceptual site model can also be useful in identifying data gaps for further investigation.

The identified potential sources, transport mechanisms, receptors and associated exposure mechanisms are summarised in **Figure 4** below.



No known sources identified. However low level PFOS detected in surface water samples.

Potential sources include:
- Undocumented AFFF storage or use
- Aviation hydraulic fluid
- Foam extinguishers
- Use of fire appliances that previously contained AFFF
- Off-site sources

Exposure Route	Human On-site	Human Off-site	Terrestrial Biota	Aquatic Biota
Ingestion	○	○	○	○
Inhalation	●	○	○	○
Dermal Contact	●	○	○	○
Ecological	○	○	●	○
Ingestion	○	○	○	○
Inhalation	●	●	○	○
Dermal Contact	○	○	○	○
Ecological	○	○	○	○
Ingestion	○	●	○	○
Inhalation	○	○	○	○
Dermal Contact	○	○	○	○
Ecological	○	○	●	●
Food	○	●	○	○
Ingestion	○	○	○	○
Inhalation	○	○	○	○
Dermal Contact	○	○	○	○
Ecological	○	○	○	●
Food	○	●	○	○

Key assumptions:
- Human health risks associated with dermal contact with PFAS impacted dust, surface water and groundwater are insignificant
- Potential for contaminated groundwater to migrate to Nepean River (Aquatic Biota receptor)
- Potential off-site use of groundwater for ingestion
- No use of surface water for drinking water supply

○ Indicates a significant source – receptor pathway is unlikely to exist
● Indicates there is the potential for a significant source – receptor pathway to exist

Figure 4 : Preliminary conceptual site model for PFAS contamination at Bankstown Airport

There are a number of source – receptor pathways shown in **Figure 4** as potentially significant. This is based on a conservative assessment of potential exposure pathways and receptors associated with PFAS contamination. However no known sources of PFAS at the Airport have been identified as part of this preliminary risk assessment and therefore complete source – receptor pathways may not exist.

Low level concentrations of PFOS have been identified in surface water samples and therefore further investigations will be required in order to reduce the current level of uncertainty on contamination risks. Potential sources of PFAS include undocumented AFFF storage or use, aviation hydraulic fluid, use of foam fire extinguishers, use of fire appliances that have contained AFFF and off-site sources.

7. Conclusions and recommendations

PFAS are emerging contaminants and their sources, fate and transport and toxicity is still not well understood. Similarly, the regulatory framework for the characterisation, assessment and management of risks associated with PFAS is evolving.

No PFAS investigations of soil or groundwater have been undertaken at the Airport. Surface water sampling undertaken by SMA in February, 2016 identified low level concentrations of PFOS (0.06 µg/L and 0.26 µg/L) in two samples collected from an open drain close to the Helicopter Landing Site. It is noted that these samples were collected during dry conditions. Potential sources of PFAS that may have contributed to these concentrations include undocumented storage or use of AFFF, aviation hydraulic fluid, use of foam fire extinguishers, use of fire appliances that contained foam and off-site sources. Based on these two sample results alone, the site would be a Priority 2 site under the NSW EPA Decision Tree for prioritising sites potentially impacted with PFAS. The NSW EPA Decision Tree states that Priority 2 sites are to be further investigated once investigations at Priority 1 sites are completed.

There is no known beneficial use of groundwater at or in the near vicinity of the Airport. Groundwater from the Airport likely discharges to the Nepean River and therefore risks to beneficial users of groundwater on the opposite side of the Nepean River are considered to be low.

The Draft Australian and New Zealand Water Quality Guidelines for ecological impacts associated with PFOS in freshwater range from 0.00023 µg/L for high conservation value ecosystems (99% species protection) to 31 µg/L for highly disturbed ecosystems (80% species protection). It is likely that the guideline value for slightly to moderately disturbed ecosystems (PFOS concentration of 0.13 µg/L) would apply for the Nepean River based on general guidance issued by the NSW Government (NSW DEC, 2006).

Therefore, the potential for surface water containing PFAS from the Airport to discharge to the Nepean River and impact on aquatic ecosystems is likely the most significant source – receptor pathway identified in this preliminary risk assessment. In order to further assess this risk, it is recommended that SMA undertakes the following:

1) **Survey of the surface water drainage network at the Airport**. This should include identification of surface water drainage structures, potential overland flow paths and discharge points to the Nepean River.
2) **Upgrade to the current surface water quality monitoring program.** Once the survey of the surface water drainage network has been completed, a review of the surface water sampling locations should be undertaken. These should include sampling locations in the Nepean River upgradient, of the Airport discharge points, at the discharge points and downgradient of the discharge points. The analysis suite should also be upgraded to include a more comprehensive suite of PFAS compounds. As a minimum, perfluorohexane sulfonic acid (PFHxS) should be included in all future PFAS analysis.
3) **GEMS 002 PFC – management actions advice**. For the purposes of GEMS 002, this Preliminary PFAS Risk Assessment could be used as a Trigger Assessment for new activities at the Airport. The risk of significant PFAS contamination to be present at the Airport is considered low and further investigation is not considered necessary. However, should a detailed site investigation be undertaken for other reasons (ie. potential presence of non-PFAS contaminants) then it is recommended that PFAS compounds are included in the laboratory analysis suites. Additional data on PFAS concentrations in soil, groundwater or surface water at the Airport should be compiled to support updates to the Conceptual Site Model and revisions of the risk assessment in the future.

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Document 2

JACOBS

Preliminary Contamination Investigation

South West Precinct, Bankstown Airport

23 April 2018

Preliminary Contamination Investigation
SW Precinct Bankstown Airport

Client Name:	Bankstown Airport Limited
Document Title:	Preliminary Contamination Investigation - SW Precinct Bankstown Airport
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Contents

Executive Summary

Jacobs Group (Australia) Pty Ltd (Jacobs) was commissioned by Bankstown Airport Limited (BAL) to prepare a preliminary contamination investigation (PCI) to support the Major Development Plan (MDP) application for the South West Precinct (SWP) located at Bankstown Airport.

The PCI has been prepared in general accordance with and provides strategies for investigations and management of contaminated materials in line with the following nationally endorsed guideline documents:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999,* as revised 2013 (NEPM, 2013)
- HEPA (January, 2018) *PFAS National Environmental Management Plan* (PFAS NEMP).

THE PCI involved a review of available information in context of current nationally endorsed guideline documents and the *Airports (Environmental Protection) Regulations 1997* (AEPR).

Based on the information provided, significant investigation effort has historically (since 2005) been undertaken across SWP (not including the western portion of the site). Over 300 test pits and boreholes have been excavated across the site to assess contamination with over 400 samples submitted for laboratory analysis.

The results of the investigations undertaken indicated the following:

- Bonded and friable asbestos containing materials (ACMs) have been identified sporadically at the surface and buried in fill material and stockpiles present across the SWP. Friable asbestos was identified in one sample only.
- Benzo(a)pyrene contamination has been identified in stockpiled material at isolated locations across the SWP (DLA, 2014). The elevated benzo(a)pyrene concentrations are likely to be associated with bitumen identified within the material sampled.
- Localised hydrocarbon staining was present in the vicinity of the aviation museum.

The information review has also identified a number of data gaps with the respect to the SWP development areas as detailed below:

- Asbestos has been identified sporadically at the surface and buried in fill material and stockpiles present across the SWP. Previous investigations and remedial works undertaken at the SWP have detailed that measures will be required to manage the asbestos identified at the site including remediation action plans, unexpected finds protocols and validation (should earthworks be undertaken at the site). In accordance with the remediation hierarchies and preferred approaches for the management of asbestos on sites detailed in national guidance and supporting documents, the current proposed approach for the SWP is to manage the asbestos in soils in situ under appropriate management plans.
- Hydrocarbon stained areas have been previously observed surrounding the aviation museum associated with leaks from parked planes. The contamination status of these areas are not known and will require investigation and remediation/management (should contamination be identified)
- A fire incident (2003) was reported within the SWP. The presence of per- and polyfluoroalkyl substances (PFAS) contamination within this area is not known and will require investigation and remediation/management (should contamination be identified)

- The western corner of the SWP has not been investigated as part of previous studies. In consideration of the general airport use of this area and presence of a former spray painting facility, the western corner of the SWP will require investigation.
- A number of previous investigations were undertaken prior to the implementation of current national guidance for the assessment and management of contaminated sites. New national guidance requires selected contaminant compounds to be assessed in different ways to that of the historical guideline values. To assess previous laboratory data in context of current guidelines, additional samples will need to be collected and analysed to allow for comparisons.
- Volatile organic compounds (VOC) are known to be present in groundwater to the east of the SWP (within the former Boeing site). Groundwater adjacent to the eastern boundary of the site will need to be investigated for VOC to assess potential vapour partitioning and associated risk (should elevated concentrations of VOC be identified). If vapour risks are identified, designs will need to include adequate measures to suitably reduce vapour risks to site occupants,

Jacobs findings from the information review are generally consistent with the conclusions and recommendations detailed in previous investigations (i.e. that the site in its current condition is considered suitable for commercial/industrial land use).

Based on the results of the investigations undertaken to date and subject to the results of the proposed investigations (detailed within this PCI), the site in its current condition is considered suitable for commercial/industrial land use subject to appropriate environmental management plans being implemented at the site during both construction and occupation to manage potential exposure to site occupants, adjacent land users and environmental receptors.

1. Introduction

Jacobs Group (Australia) Pty Ltd (Jacobs) was commissioned by Bankstown Airport Limited (BAL) to provide contamination assessment and remediation advice to support the Major Development Plan (MDP) application entitled **"***Bankstown Airport – South-West Precinct Site Works and Warehouse MDP".*

Jacobs understands that there are plans to redevelop the South West Precinct (SWP) for predominantly commercial / industrial land use together with a mixed use service precinct. To support the MDP, historical contamination issues at the SWP need to be understood at and an assessment made as to whether the site is suitable or can be made suitable for the proposed commercial / industrial land use.

As part of the provision of the contamination assessment and remediation advice, Jacobs has prepared the following preliminary contamination investigation (the subject of this document) to support the development of a detailed investigation plan (if required) for the SWP to assess contamination in context of its proposed use involving:

- A review and consolidation of historical and available information (with respect to contamination)
- An assessment of data gaps
- Development of an investigation plan to address the data gaps identified in consideration of the proposed commercial / industrial land use.

The preliminary contamination investigation (PCI) was prepared in accordance with the requirements for the preliminary site investigation as detailed in Schedule B2 of the NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as revised 2013 (NEPM, 2013).

Based on the known understanding of the contamination status of the SWP, the aim of the PCI and subsequent investigations is intended to support the reuse of pre-existing on-site materials in context of the proposed commercial / industrial land use on airport land.

2. Background

The SWP is predominantly vacant airport land, with a small portion occupied by an aviation museum, some redundant buildings and a services building. The redundant buildings, located on the western corner of the SWP were formerly used as flying schools and a spray painting facility.

In 2008, “Stage 1” bulk earthworks were undertaken across the SWP to facilitate proposed redevelopment including the construction of a raised platform and drainage works – referred to as “Stage 1”. Stockpiling of material from Lots 801 and 803 (understood to be located on airport land to the east of the SWP) is referred to as Stage 2.

Numerous detailed contamination investigations have been undertaken across the SWP to date including over 300 boreholes and test pits. The investigations reviewed to support the assessment of contamination at the SWP are detailed below:

- Consulting Earth Scientists (November 2005) *Stage 2 Environmental Site Assessment: Area 6, Bankstown Airport* (CES, 2005)
- Consulting Earth Scientists (April 2009) *Environmental Management Plan: Construction Phase, Stage 1 – South West Precinct, Bankstown Airport NSW* (CES, 2009)
- DLA Environmental (May 2009) *Asbestos Contamination Assessment: South West Precinct Stages 1 and 2, Bankstown Airpor*t (DLA, 2009a)
- DLA Environmental (May 2009) *Remediation Recommendations Asbestos Contamination: South West Precinct Stages 1 and 2, Bankstown Airport* (DLA, 2009b)
- DLA Environmental (May 2009) *Remediation Recommendations Asbestos Contamination: South West Precinct Stages 1 and 2, Bankstown Airport* (DLA, 2009c)
- Consulting Earth Scientists (November 2013) *Bankstown Hyperdome Site Remediation Strategy* (CES, 2013)
- DLA Environmental (May 2014) *Fill Material Landuse Suitability Assessment: Lot 305 DP10774400, 41 L Starkie Drive, South West Precinct, Bankstown Airport* (DLA, 2014)
- DLA Environmental (March 2015) *Fill Material Landuse Suitability Assessment: Lot 305 DP10774400, 41 L Starkie Drive, South West Precinct, Bankstown Airport* (DLA, 2015)
- Jacobs (January 2017) *Preliminary PFAS Risk Assessment for Bankstown Airport* (DLA, 2017).

To assist with understanding the extent of the previous investigations a visual representation was prepared by Crawford Architects for Altis Property Partners (Altis) which details the sampling locations from the previous investigations and specific site features including Stage 1, Stage 2, the western portion of the SWP (Lot 231 in DP 1132273) and the stockpiling from Lots 801 and 803. This contamination summary is presented within the figures section of this report.

2.1 CES, 2005

The CES (2005) investigation was undertaken in October 2005. The investigation was undertaken in accordance with a Sampling, Analysis and Quality Plan (SAQP). The SAQP was prepared in accordance with the following guidelines:

- NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995)
- National Environment Protection Measure (NEPM) 1999. *Schedule B(2) Guideline on Data Collection, Sample Design and Reporting* (NEPM, 1999)

The report was prepared in general accordance with the requirements specified for a Stage 2 ESA as published by the NSW Environment Protection Authority (EPA) in the 1997 *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 1997).

The site assessment criteria adopted for the investigation was consistent with NSW EPA endorsed guidelines at the time of undertaking the investigation.

A summary of the results of the investigation are detailed below:

- 130 boreholes were excavated in a grid pattern across the SWP. The western portion of the SWP (Lot 231 in DP 1132273) was not investigated.
- The southern portion of the site had been substantially filled. Anecdotal information indicated that the fill was sourced from the M5 Motorway construction site.
- Three stockpiles of construction materials were present along the southern site boundary to the east of the aviation museum and consist of crushed sandstone material with minor concrete content, general construction wastes (asphalt, soil, concrete, rocks) and basalt rocks typically used to fill gabion baskets. A stockpile of wood chips was also present within the aviation museum area. The contamination status of the woodchip stockpile was not assessed.
- The laboratory analysis of fill, soil and stockpile samples for heavy metals, total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbons (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), phenols and asbestos indicated that concentrations of these contaminants were below the soil investigation levels.
- Minor surface staining was noted in the northern and eastern portions of the aviation museum lease area
- No groundwater was observed during the drilling program. Shallow groundwater, where present, is likely to be perched above the natural clay soils and is anticipated to flow in a south westerly direction towards the Georges River.

Based on the results of the information review and the site assessment, the site was considered suitable for commercial/industrial redevelopment and any excavated material from the site was suitable for reuse on other areas of Bankstown Airport during future commercial/industrial development subject to the following:

- An investigation of the areas of localised spillages observed within the northern and eastern portions will need to be undertaken to quantify the level of contamination present within these areas. If contamination is present at concentrations exceeding the soil investigation levels, this contamination should be managed and/or remediated so that the site is suitable for its proposed use.
- If material is to be removed off-site, it is recommended that additional testing (TCLP) be undertaken to reduce the waste classification to the lowest possible waste classification.

2.2 CES, 2009

The CES (2009) Environmental Management Plan (EMP) was prepared for application on the Stage 1 of the SWP area to provide guidance for the management of bonded Asbestos Containing Material (ACM) impacted fill during the construction of the on-site commercial/industrial facilities and associated elements.

During excavation associated with the bulk earthworks phase of the proposed commercial/industrial development, isolated fragments of bonded ACM as cement sheeting were identified. The ACM was noted during the excavation and placement of fill material across the site that was sourced from the southern fill embankment. Where observed, ACM fragments were collected and disposed off-site. However, it was considered likely that minor quantities of ACM fragments may be present as scattered occurrences within the various fill placements at the site.

To further assess the source of the bonded ACM, test pitting was undertaken within the southern fill embankment on 27 and 29 August 2008. The test pitting indicated that isolated fragments of bonded ACM were present within different fill types within the southern portion of the fill embankment. Consequently, the source of the bonded ACM observed is likely to be the fill material placed within the embankment located at the southern portion of the SWP. This fill was reportedly sourced from the construction of the M5 freeway. Based on the review, the number of test pits excavated across the southern fill embankment in not known.

2.3 DLA, 2009a

The DLA (2009a) assessment was undertaken in April 2009.

A summary of the results of the assessment are detailed below:

- The assessment comprised excavation and bulk sample collection from 89 test pits and a visual inspection of site surfaces across Stage 1 and Stage 2 of the SWP and the aviation museum site.
- 10 samples of fragments of potential ACM were submitted for laboratory identification.
- 23 bulk soil samples were submitted for asbestos fibre identification.
- Asbestos fragments were positively identified across Stage 1 and the aviation museum.
- Asbestos fibres were not identified in the 23 soil samples submitted for identification.
- Minor isolated surface bonded asbestos fragments were located within the north eastern and northern boundary of Stage 1, eastern portion of Stage 2, eastern area of the aviation museum, eastern and northern boundary of the top soil stockpile.

The results of the assessment indicated the presence of minor isolated bonded asbestos fragment contamination within both fill materials of Stage 1, the aviation museum and the top soil stockpile. Minor isolated surface contamination was present within isolated areas of Stage 1, Stage 2, the aviation museum and the top soil stockpile.

The in-situ and surface contamination was assessed as bonded in nature and in good condition, therefore posing minimal risk to human health and the environment in general.

The DLA (2009a) assessment recommended that all asbestos occurrences should be addressed in a professional and responsible manner and for this reason remedial activities should be undertaken.

Further recommendations included prior to any further development or increased access to site, a remediation action plan (RAP) should be implemented to minimise the risk of exposure and provide a site suitable for future construction activities.

2.4 DLA, 2009b

The DLA (2009b) remediation recommendations was prepared and detailed remediation strategies (excavation, spreading and hen picking) for the asbestos identified at the SWP.

2.5 DLA, 2009c

DLA undertook remediation and subsequent asbestos clearance certification of the site known as Bankstown Airport South West Precinct – Stages 1 and 2. Based on the review of the DLA (2009c), only certification was provided for certain areas within Stage 1.

The works associated with DLA (2009c) asbestos clearance certification was undertaken between April and May 2009. This investigation, subsequent inspections and asbestos clearance certifications were conducted in accordance with Part 11 Clearance to Reoccupy an Asbestos Work Area of the NOHSC: 2002 *Code of Practice for the Safe Removal of Asbestos – 2nd Edition 2005*. The bulk soil sampling was conducted in accordance with the NSW EPA (1995) guidelines. A total of 23 bulk soil samples were submitted for laboratory asbestos identification (presence / absence). The remediation works were undertaken in accordance with the DLA (2009a) remediation recommendations.

The remediation involved the excavation and hen picking of the asbestos contaminated areas. The process continued until such a time that the David Lane Associates representative present was satisfied that the contaminated materials had been removed.

DLA concluded that the clearance inspections and soil analysis results were satisfactory and indicated that asbestos containing materials had been successfully removed from the South West Precinct Stage 1, Bankstown Airport. The site could now be accessed and future works undertaken without risk to health or the environment generally.

DLA also provided the following limitation statement within the report. Due to the nature of asbestos fragment material it is never possible to guarantee every fragment of asbestos containing material has been removed. In the unlikely event that soil disturbance uncovers a fragment of an asbestos containing material, given its bonded matrix and isolated nature, this event would not pose an unacceptable health risk from the property or risk to the environment generally. However, all asbestos events should be addressed in a professional and responsible manner and for this reason an Unexpected Finds Protocol has been included for future construction activities in the clearance documentation.

2.6 CES, 2013

The CES (2013) remediation strategy summarized the results of the investigation undertaken between 2005 and 2009 as detailed below:

- Fill depths were mostly less than 2m, but in some cases fill depths over 3m were recorded, generally fill depths are greatest in the eastern part.
- Fill materials comprise mostly sandy and clayey soil, but with minor quantities of demolition materials including concrete, bricks, wood, asphalt, road base, aggregate, sandstone and occasionally plastic, metal, tiles etc.
- It appeared as though some fill had been introduced to the northern or Stage 1 area since the original investigation by CES in 2005.
- The initial Site Assessment by CES in 2005 noted that the concentrations of all potential contaminants tested in soil and fill samples (including metals, petroleum hydrocarbons, BTEX, PAHs, organochlorines, organophosphates, phenols and asbestos) on the site were below the appropriate soil investigation levels for commercial and industrial land uses.

- The CES 2005 report concluded that the site was suitable for commercial/industrial redevelopment.
- Additional investigations by CES in 2008 during earthworks identified the presence of some asbestos cement pieces in some areas of the fill. Subsequent investigations over the whole site area by DLA in 2009 found asbestos fragments in 3 of 40 test pits in the Stage 1 area (and as visible surface fragments in much of the strip adjoining the north-eastern boundary of Stage 1). DLA also found asbestos fragments in several test pits within the Australian Aviation Museum area (which was within the Stage 2 area).
- Some remediation of asbestos was then carried out in the Stage 1 area in accordance with the DLA Remediation Recommendations (also in May 2009) in that the areas of the 3 test pits were excavated and the fill materials ‘hen picked’ to remove the fragments of asbestos material. These materials and each of the pits were then given a visual clearance certification that no asbestos fragments remained present; also a bulk soil sample was collected from each and subjected to analysis for asbestos fibres (these all showed no asbestos fibre presence).
- The DLA asbestos clearance report noted that while the ‘remedial’ works were specifically targeted at where the asbestos contamination had previously been reported, it was also possible (even likely) that asbestos fragments are still present in other areas of Stage 1, though not observed in the other test pits dug. For this reason, DLA included an ‘Unexpected Finds Protocol’ in their asbestos clearance report, to be applied in any future earthworks or construction activities at the site.
- Note that no ‘remediation’ works appear to have been undertaken in the Stage 2 or Australian Aviation Museum area (where asbestos was also found by DLA).
- Although asbestos cement fragments have been found and are known to be still present in some areas, particularly in the Stage 2 area, it is important to note that there have been no laboratory analyses of fill samples (by either CES or DLA) which have showed the presence of asbestos fibres.
- Localised staining of the surface was noted in parts of the Aviation Museum area, probably a result of spillage of oil and fuels, and should be assessed to determine whether the levels of contamination exceed the appropriate site criteria.

CES (2013) considered that there had been adequate environmental investigations and soil and fill assessment of the subject site to properly characterize the sub-surface conditions for the proposed redevelopment.

2.7 DLA, 2014

The DLA (2014) investigation was undertaken in April 2014. The investigation targeted approximately 80,000m^3 of stockpile material spread across approximately 2.7ha which had been imported to the SWP. The source of the stockpiled material was not detailed in the report. General information with respect to the investigation is detailed below:

- The investigation was subject to data quality objectives consistent with the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPM, 2013) and Australian Standard (AS) 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds.
- The sampling program was designed in accordance with the NSW EPA (1995) guidelines.
- Sampling and analysis was undertaken in accordance with the NSW EPA (1995) guidelines, NEPM 2013 and AS4482.1-2005.

- Site assessment criteria was based on Schedule B1 Guideline on the Investigation Levels for Soil from the NEPM (2013) Table 1(A)1 Column A – Residential A HIL Criteria; and NSW EPA Guidelines for the NSW Site Auditor Scheme, second edition 2006.

A summary of the results of the investigation are detailed below:

- 60 test pits were excavated in a grid pattern across the stockpiled material.
- Brown gravelly clay fill was found over the majority of the assessment area to a maximum depth of 4m below stockpile surface from the maximum height of the stockpiled material. Fill soils across the assessment contained minor demolition rubble including bricks, concrete, sandstone and ceramics with minor amounts of asphalt rubble. Very minor amounts of ACM were identified within the stockpile.
- 88 primary samples were collected from the test pits for laboratory analysis for a range of common contaminant compounds including heavy metals, asbestos, Total Recoverable Hydrocarbons (TRH), BTEX, OCP, OPP, PAH and PCB.
- Heavy metals, OCP, OPP, PCB, TRH and BTEX fractions of the soil analytical results were found to comply with the appropriate health investigation levels (HILs) for the site. Two (2) samples were observed to exceed the HILs for benzo(a)pyrene (BaP) toxic equivalency factor (TEQ), however the 95% upper confidence limit (UCL) for BaP TEQ complies with the site assessment criteria (SAC). Given the presence of bitumen/asphalt within the stockpiled material, and the limited nature of the identified presence of elevated PAH compounds, it is considered appropriate to attribute the elevated detections of BaP to fragments of bitumen in soil. Based on limited extent of elevated concentrations within the stockpile, limited distribution of the two (2) exceedances and the compliance of the 95% UCL for BaP TEQ, it is surmised, therefore that the hotspots identified are not statistically significant and that the contamination is immobile within bitumen and does not pose a risk to human health.
- Fragments of fibre cement sheeting were observed in test pits 3, 5, 24, 45 and 47. Fragments were found at varying depths within the fill material and were sporadic with no substantial concentrations observed. The quantity of asbestos observed within these test pits was minimal with one (1) fragment found in each. Asbestos quantification of ACM in soil was assessed against the total volume of the test pit as all ACM fragments observed were included in the gravimetric calculation. No location was found to exceed the w/w% criteria for ACM or asbestos fines (AF) or fibrous asbestos (FA). It is the opinion of DLA that the ACM containing test pits assessed are representative of the remaining two (2) test pits observed to contain asbestos that were unquantified.
- The sampling regime and subsequent assessment and reporting of the site was considered to be adequate to determine the suitability of the site in accordance with the NSW EPA (1997) guidelines. No evidence could be found to infer chemical contamination by petroleum hydrocarbons, pesticides, PCBs or heavy metals at the site. Two (2) minor hotspots of PAH were observed however these are considered to be due to the presence of asphalt fragments in the sample and not representative of wider conditions within the stockpiled soils.
- A minor number of asbestos fragments were observed within the stockpile; however, w/w% analysis indicates these do not make the land unsuitable for a residential land use. No detection of AF/FA was recorded.
- All samples collected from stockpiled fill material were assessed and found to be compliant with the threshold criteria provided in the NEPM (2013) Column A – Residential with garden / accessible soils, the

most sensitive land use suitability criteria. DLA understood that the proposed future land use of the site was consistent with the definition of Column D – Commercial / Industrial within the NEPM (2013). Therefore, compliance with the most sensitive criteria, Residential A, also indicated compliance with the less sensitive criteria, Commercial / Industrial, concluding that the stockpiled materials were suitable for the future intended land use.

- Further criteria for asbestos stipulates that no visible asbestos is to be present at the surface (100mm). Therefore, if reshaping or spreading of stockpile materials is undertaken, an inspection of any new surface created should be undertaken to ensure compliance with NEPM (2013) guidelines.

2.8 DLA, 2015

The DLA (2015) investigation was undertaken in March 2015. The investigation targeted approximately 15,000m^3 of stockpile material spread across approximately 0.8 hectares which had been imported to the SWP. The source of the stockpiled material was reportedly from Lot 803 Steel Street, Bankstown Airport.

General information with respect to the investigation is detailed below:

- The investigation was subject to data quality objectives consistent with the NEPM (2013) and AS4482.1-2005.
- The sampling program was designed in accordance with the NSW EPA (1995) guidelines.
- Sampling and analysis was undertaken in accordance with the NSW EPA (1995), NEPM (2013) and AS4482.1-2005.
- Site assessment criteria was based on Schedule B1 Guideline on the Investigation Levels for Soil from the NEPM (2013) Table 1(A)1 Column A – Residential A HIL Criteria and the Airports (Environment Protection) Regulations 1997 (AEPR, 1997).

A summary of the results of the investigation are detailed below:

- 20 test pits were excavated in a grid pattern across the stockpiled material.
- Brown gravelly clay fill was found over the majority of the assessment area to a maximum depth of 3.6m below stockpile surface from the maximum height of the stockpiled material. Testing was limited to the stockpile rather than the fill previously tested in May 2014. Fill soils across the assessment contained minor demolition rubble including bricks, concrete, sandstone and ceramics with minor amounts of asphalt rubble. Very minor amounts of ACM were identified within the stockpile.
- 34 primary samples were collected from the test pits for laboratory analysis for a range of common contaminant compounds including heavy metals, asbestos, TRH, BTEX, OCP, OPP, PAH and PCB.
- Heavy metals, pesticides, PCB, TRH and BTEX fractions of the soil analytical results were found to comply with the appropriate HILs for the site. One sample collected from test pit 16 tested positive for AF/FA, however this detection was suspected to be caused by the smearing of an asbestos fragment during the excavation of the test pit and was not indicative of the presence of AF/FA throughout the test pit. Another sample was later collected from test pit 16 and recorded no detection of AF/FA.
- Fragments of fibre cement sheeting were observed in test pits 1, 15, 16, 17 and 19. Fragments were found at varying depths within the fill material and were sporadic with no substantial concentrations observed. The quantity of asbestos observed within these test pits was minimal with one (1) fragment found in each. Asbestos quantification of ACM in soil was assessed against the total volume of the test pit as all ACM

fragments observed were included in the gravimetric calculation. No location was found to exceed the w/w% criteria for ACM or AF/FA.

- The sampling regime and subsequent assessment and reporting of the site was considered to be adequate to determine the suitability of the site in accordance with the NSW EPA (1997) guidelines. No evidence could be found to infer chemical contamination by petroleum hydrocarbons, pesticides, PCBs or heavy metals at the site. A minor number of asbestos fragments were observed within the stockpile; however, w/w% analysis indicates these did not make the land unsuitable for a residential land use.
- All samples collected from stockpiled fill material were assessed and found to be compliant with the threshold criteria provided in the NEPM (2013) Column A – Residential with garden / accessible soils, the most sensitive land use suitability criteria. DLA understood that the proposed future land use of the site was consistent with the definition of Column D – Commercial / Industrial within the NEPM (2013). Therefore, compliance with the most sensitive criteria, Residential A, also indicated compliance with the less sensitive criteria, Commercial / Industrial, concluding that the stockpiled materials were suitable for the future intended land use. All samples were also compliant with AEPR (1997) criteria.
- In its current location the stockpile was stable and based on a visual inspection there was no asbestos at the surface (100 mm) which ensures a safe environment. Given this and the fills compliance with the most sensitive criteria, Residential A, it was considered no further action was required in relation to the stockpile. If reshaping or spreading of stockpile materials was undertaken, an inspection of any new surface created should be undertaken to ensure compliance with NEPM (2013) guidelines.

2.9 Jacobs, 2017

Jacobs were commissioned by BAL to undertake a preliminary per- and polyfluoroalkyl substances (PFAS) risk assessment for the entire Bankstown Airport site. Historical activities at the Airport have included the use of Aqueous Film Forming Foams (AFFF) for firefighting and fire training purposes. At least one of the foam types historically used at the Airport, 3M Lightwater, contained PFAS. Other activities at the Airport may also have involved the use of products containing PFAS. These chemicals have been identified as presenting potential risks to human health and the environment.

Information provided by NSW Fire and Rescue detailed the following:

- 11/11/2003 – Aircraft fire on runway – low expansion AFFF foam was used. BAL advised that this incident occurred in an area known as the “southern triangle”, north of the aviation museum which has since been filled.

The approximate location of the 2003 fire incident is provided on **Figure 1**.

The Jacobs (2017) risk assessment recommended that for the purposes of GEMS 002, the risk assessment could be used as a Trigger Assessment for new activities at the Airport. For activities that will be located in or in the vicinity of the identified potential PFAS source areas, Preliminary and Detailed Site Investigations in accordance with Schedule A of the NEPM should be undertaken. For activities located outside these areas, the risk of significant PFAS contamination to be present is considered low and further investigation is not considered necessary. However, should a detailed site investigation be undertaken for other reasons (ie. potential presence of non-PFAS contaminants) then it is recommended that PFAS compounds are included in the laboratory analysis suites.

2.10 Summary

Significant investigation effort has historically been undertaken across SWP (not including the western portion of the site). Over 300 test pits and boreholes have been excavated across the site to assess contamination with over 400 samples submitted for laboratory analysis.

A summary of the investigations undertaken is provided in **Table 2.1**.

Table 2.1: Contamination Investigation Summary

Reports	Test Pits (No.)	Boreholes (No.)	Sample Analysed [1]	Assessment Guidelines
CES, 2005	-	130	263 - Heavy metals 133 - PAH 133 - TPH/BTEX 120 - OCP/OPP 23 - Phenols 19 - Asbestos identification	A and B only. Presence / absence adopted for asbestos guidelines.
CES, 2009	Test pits excavated to visually assess asbestos content in fill. The number of test pits excavated is not known.			Presence / absence adopted for asbestos guidelines.
DLA, 2009a	89	-	33 - Asbestos identification	Presence / absence adopted for asbestos guidelines.
DLA, 2009b	No sampling or analysis undertaken			
DLA, 2009c [2]	-	-	23 - Asbestos identification	Presence / absence adopted for asbestos guidelines.
CES, 2013	No sampling or analysis undertaken			
DLA, 2014	60	-	88 - Heavy metals 88 - PAH 88 - vTRH/BTEX 88 - TRH 32 - OCP/OPP 11 - Asbestos identification 6 - Asbestos gravimetric analysis	C and D only.
DLA, 2015	20	-	34 - Heavy metals 34 - PAH 34 - vTRH/BTEX 34 - TRH	C and E only.

			34 - PCB 26 - Asbestos identification 21 - Asbestos gravimetric analysis	
Jacobs, 2017	No sampling or analysis undertaken			

Assessment Guidelines
A – NSW EPA (1994) *Contaminated Sites: Guidelines for Assessing Service Station Sites* (no longer in force)
B – NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999* (no longer in force)
C – NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999,* as revised 2013
D – NSW EPA (2006) *Contaminated Sites: Guidelines for the Site Auditor Scheme* 2^{nd} *Edition* (no longer in force)
E – *Airports (Environmental Protection) Regulations 1997.*

[1] Only soil and material (potential asbestos containing material) samples collected from the SWP. No groundwater sampling to date has been undertaken.

[2] Samples for asbestos collected for validation of remediation works only. No additional test pits / boreholes excavated.

The results of these investigations to date have indicated the following (with respect to contamination):

- Bonded and friable asbestos containing materials (ACMs) have been identified at the surface and buried in fill material and stockpiles present across the SWP. Friable asbestos identified in one sample only.
- Benzo(a)pyrene contamination has been identified in stockpiled material at isolated locations across the SWP (DLA, 2014). The elevated benzo(a)pyrene concentrations are likely to be associated with bitumen identified within the material sampled.
- Localised hydrocarbon staining was present in the vicinity of the aviation museum.

Jacobs has undertaken a review of all analytical data provided and have assessed concentrations in context of the NEPM 2013 and AEPR (1997) guidelines. The results of the review are detailed below. Tables providing a summary of the results is provided in **Appendix A**.

- Arsenic (417 samples) – 6 samples greater than AEPR EIL (1% of all samples analysed) and 1 sample greater than NEPM EIL (0.2% of all samples analysed).
- Cadmium (417 samples) – 2 samples greater than AEPR EIL (0.5% of all samples analysed) and 2 samples greater than NEPM EIL (0.5% of all samples analysed).
- Chromium (417 samples) – 2 samples greater than AEPR EIL (0.5% of all samples analysed).
- Copper (417 samples) – 8 samples greater than AEPR EIL (2% of all samples analysed) and 2 samples greater than NEPM EIL (0.5% of all samples analysed).
- Lead (417 samples) – 1 sample greater than AEPR EIL (0.2% of all samples analysed).
- Mercury (417 samples) – 2 sample greater than AEPR EIL (0.5% of all samples analysed) and 2 sample greater than NEPM EIL (0.5% of all samples analysed).
- Nickel (417 samples) – 4 samples greater than AEPR EIL (1% of all samples analysed).
- Zinc (417 samples) – 6 samples greater than AEPR EIL (1% of all samples analysed).
- Benzo(a)pyrene (255 samples) – 11 samples greater than NEPM ESL (4% of all samples analysed) and 1 sample greater than AER HIL (0.4% of all samples analysed).
- Total PAH (255 samples) – 28 samples greater than AEPR EIL (11% of all samples analysed) and 1 sample greater than AER HIL (0.4% of all samples analysed).
- Asbestos-All Forms (27 samples) – 18 samples greater than NEPM HIL.

- Asbestos-ACM (66 samples) – 2 samples greater than NEPM HIL
- Asbestos -AF/FA (79 samples) - 1 sample greater than NEPM HIL.

The review of the analytical data in context of current NSW EPA endorsed guidelines and the AEPR (1997) indicate that only one sample for Benzo(a)pyrene, one sample for total PAH and 18 samples for asbestos (assuming that all asbestos was identified in soil samples within 300mm of site surfaces, acknowledging that some asbestos is present at the surface of the SWP) exceeded the respective guidance for the protection of human health in context of the site use (i.e. commercial/industrial and airport use). The elevated Benzo(a)pyrene and total PAH concentrations in one sample are likely to be associated with bitumen materials observed at this sample location. These compound are likely to be well bound within the bitumen and are unlikely to be readily leachable. In this bound and low leachable condition, these compounds are unlikely to represent an ongoing risk to environmental (groundwater and surface water) receptors. Asbestos (as both fibres and bonded asbestos) are likely to be present at the surface and throughout the fill material (placed and stockpiled) present across the site. Asbestos does not represent a risk to environmental receptors.

Considering that the majority of the site is highly modified from extensive filling (likely to represent a highly disturbed terrestrial ecosystem with little ecological value), the exceedances of EILs are unlikely to pose a risk to terrestrial ecosystem (if present) within this area.

The Jacobs (2017) risk assessment indicated that potential PFAS contamination sourced from a historical aircraft fire is located within the SWP. The PFAS contamination (if present) is likely to be located below the level of the current site surface (interface between the fill placement and the former ground surface) as the information on the crash preceded the earthworks undertaken on the site. Considering the requirements of the HEPA (January, 2018) *PFAS National Environmental Management Plan* (PFAS NEMP), this area should be subject to detailed site investigation.

Based on the results of the investigations undertaken to date and subject to the results of the proposed investigations (detailed hereinafter), the site in its current condition is suitable for commercial/industrial land use subject to appropriate environmental management plans being implemented at the site during both construction and occupation to manage potential exposure to site occupants and adjacent land users.

3. Data Gaps

The following is based on a review of available information, site understanding and an assessment of risks (with respect to contamination) which may impact upon the development of the SWP if not addressed.

3.1 Asbestos

Asbestos (bonded and friable) has been identified sporadically across the surface of the SWP and within buried fill materials.

In accordance with NEPM (2013) and Western Australian Department of Health (May 2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (WADOH, 2009) guidelines, the proposed approach to the known asbestos present in fill material at the SWP is to accept that asbestos is present at the site and to develop and implement an Environmental Management Plan (EMP) to control risks associated with the asbestos and potentially other contamination (if present). This would include management of risks during construction and ongoing management of the asset.

Information from nationally endorsed guidelines to support the management of asbestos identified at the site in situ as part the redevelopment of the site is detailed below.

The NEPM (2013) states the following with respect to asbestos materials in soil:

- *"Depending on the site-specific circumstances and the proposed remediation approach, conservative management of presumed asbestos contamination may avoid the need for a detailed site investigation"*.
- *"Remediation options which minimize soil disturbance and therefore public risks are preferred. Management of asbestos in situ is encouraged, which may include covering the contamination with uncontaminated fill or other protective or warning layers. It should be noted that the alternative of complete removal of asbestos from a site often involves extensive and costly investigative and validation sampling and may not be effective or necessary for the protection of human health".*

The WADOH, 2009 states the following with respect to the risk assessment, remediation and management of asbestos:

- *"DOH considers that the health risks posed by an appropriately managed site, whereby the asbestos remains in situ subject to controls, are likely to be negligible and often preferable to removing the asbestos containing materials from site".*

The WADOH (2009) guidelines details a number of advantages associated with in situ remediation including:

- *"Minimal disturbance of soil and therefore minimal dust generation*
- *Minimization of the amount of sampling necessary*
- *Potentially lower costs, time delays and greater confidence of outcomes".*

The approach to retain material on-site has been assessed in context of the remediation hierarchy detailed in the NEPM (2013) Volume 1, Schedules A and B as detailed below. In the absence of known remediation technologies which destroy asbestos contamination, on-site containment is the next preferred level of remediation.

"In general, to achieve the desired environmental outcome, the process of the assessment of site contamination should be placed within the context of the broader site assessment and management process. In particular, in

assessing the contamination, the site assessor and others should take into account the preferred hierarchy of options for site clean-up and/or management which is outlined as follows:

- *on-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and"*

Jacobs Response: There are no known remediation technologies which destroy asbestos contamination.

- *"off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or,"*

Jacobs Response: There are no known remediation technologies which destroy asbestos contamination.

"if the above are not practicable,

- *consolidation and isolation of the soil on site by containment with a properly designed barrier; and*
- *removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;*

or,

- *where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy."*

3.2 Aviation Museum

Some localised contamination (namely spills and leaks from aircraft) are known to be present in unsealed areas surrounding the aviation museum. The on ground spills and leaks could represent a hydrocarbon and potentially a PFAS contamination source.

Although unlikely to represent a significant contamination issue in context of the redevelopment, these areas should be assessed.

The approximate location of the area potentially impacted by spills and leaks from planes at the aviation museum is provided on **Figure 1**.

3.3 PFAS

Based on information from the Jacobs (2017) PFAS risk assessment, a fire incident was reported within an area within the eastern portion of Stage 1 in 2003. Based on the information provided, no PFAS soil or groundwater assessments have been undertaken within this portion of the SWP.

The HEPA (January, 2018) *PFAS National Environmental Management Plan* (PFAS NEMP) does not provide a specific process for the assessment of PFAS contamination, however with respect to contaminated site assessments, the PFAS NEMP provides specific information to supplement that provided in the NEPM (2013). The PFAS NEMP states that with respect to source characterisation *"the nature of the potential source(s) is an important consideration for the desktop component of the preliminary site investigation and when developing the conceptual site model/sampling and analysis quality plan".*

Based on the information provided in the Jacobs (2017) assessment, the potential risk of PFAS exposure within the SWP is only present within the area of the fire incident. Information reviewed as part of preparation of the Jacobs (2017) risk assessment did not identify other areas within the SWP which could potentially be impacted by PFAS.

The targeting of the fire incident area for the PFAS investigation is consistent with the requirements of the NEPM (2013) whereby potential risks are quantified through a sampling and analysis program.

The approximate location of the 2003 fire incident is provided on **Figure 1**.

3.4 Western Corner of SWP

No investigations have been undertaken with the western corner of the SWP. This area is known to have formerly housed flying schools (including plane parking) and a spray painting facility. There is a risk that these former land uses namely degradation of ACM contained within the flying school buildings, leaks and spills from planes and the use and storage of chemicals and paints within the spray painting facility may have contaminated this area of the SWP. These activities could have contaminated surface soils surrounding the flying school and plane parking areas (degradation of building materials and small leaks and spills from planes) and deeper soils/groundwater surrounding the spray paint facility (inappropriate chemical storage and spills, especially solvents).

Detailed site investigations should be undertaken across the western corner of the SWP.

3.5 Currency

Not all previous investigations have been undertaken in accordance with current contamination guidelines relevant to the Bankstown Airport including:

- NEPM (2013)
- AEPR (1997)
- PFAS NEMP (2018).

As detailed in section 2.11, the majority of the data collected to date has been assessed in context of current guidelines which will be applicable to the site with the exception of TRH, site specific ecological levels derived for selected heavy metals (copper, chromium, nickel) and PFAS compounds which have not been tested for on the SWP.

The outcome of the additional investigations will allow for all results currently available for the site to be assessed and used in context of the current guidelines.

3.6 Other Contamination Sources

Jacobs understands that the eastern portion of the SWP borders the former Boeing facility. It is known that groundwater beneath the Boeing facility is contaminated with volatile organic compounds (VOCs). Although unlikely, partitioning of VOC contamination from groundwater (if present) could generate vapours which could accumulate within buildings or other below and above ground structures constructed as part of the proposed redevelopment in the vicinity of the eastern property boundary.

Groundwater and vapour monitoring will be undertaken in areas on the site adjacent to the former Boeing facility.

The approximate location of the VOC plume on the adjoining site (former Boeing facility) t is provided on **Figure 1**.

4. Site Inspection

An inspection of the site was undertaken on 7 March 2018 by representatives of BAL, Altis and Jacobs. The purpose of the site inspection was to ground truth the information gathered during the background information review, assess other potential contamination issues not identified within the information review and assess site access constraints with respect to physically undertaking the investigation.

At the time of the site inspection, the SWP was generally vacant land covered with grass and small shrubs. Specific site features identified during the inspection included:

- The aviation museum located within the central portion of the SWP.
- The northern portion of the SWP (Stage 1) comprises a large flattened earthworks pad.
- The southern portion of the SWP (Stage 2) is slightly raised above Stage 1 and contains large stockpile areas within the eastern portion of Stage 2.
- A number of retention ponds (or similar structures) are present to the west of the aviation museum within Stage 2.
- A number of vacant buildings (former flying schools and spray painter) are located adjacent to the western boundary of the SWP.
- Areas within the north western portion of the SWP (north west of the storm water drain) are operational areas of the airport.
- A number of stockpiles containing demolition wastes are present within the site adjacent to the southern boundary. The stockpiles appeared to have been in place for some time and maybe the stockpiles referred to in the CES (2005) report.

Based on the observations made during the site inspection and the knowledge obtained from the review of information, the site is unlikely to have been subject to other activities (other than those reported in previous investigations) that are likely to have significantly impacted the site.

5. Preliminary Conceptual Site Model

A preliminary conceptual site model (CSM) for the risks associated with PFAS contamination at the site has been developed. The purpose of the CSM is to identify known or potential sources of contamination, human health and environmental receptors including exposure mechanisms and pathways between the sources and receptors in consideration of current site conditions and proposed land use. A risk is present where there is a complete source – pathway – receptor linkage. The proposed investigation strategy to quantify potential risks have been included.

The identified potential sources, transport mechanisms, receptors and associated exposure mechanisms are summarised in **Table 5.1** below.

Table 5.1: Preliminary CSM

Source	Pathway	Receptor	Comments	Investigation Strategy
Asbestos and PAH impacted fill materials (Stage 1, Stage 2 and site stockpiles)	Inhalation (asbestos), dermal and ingestion (PAH) during excavation works associated with construction and occupation.	Construction workers, adjacent site users and future site occupants.	Proposed development strategy is to retain asbestos and PAH contaminated fill material on site. Any construction activities or future occupation of the site would require the implementation of appropriate management plans and measures to manage the exposure risks associated with these contaminated materials.	Limited investigations will be undertaken to confirm and validate the presence of these compounds. With respect to asbestos, this strategy is consistent with NEPM (2013 which states that "*Depending on the site-specific circumstances and the proposed remediation approach, conservative management of presumed asbestos contamination may avoid the need for a detailed site investigation*".
Other potential contamination within impacted fill materials (Stage 1, Stage 2 and site stockpiles). Impacted fill material needs to be assessed in accordance with current and applicable contaminated site guidelines	Inhalation, dermal and ingestion during excavation works associated with construction and occupation.	Construction workers, adjacent site users and future site occupants.	Significant amount of sampling and analysis has been undertaken for materials within Stage 1, Stage 2 and site stockpiles. However, a number of compounds (namely selected heavy metals and hydrocarbons) are assessed differently by current guidelines compared to the guidelines used during earlier site investigations. The potential exposure risk associated with contamination needs to be validated for currency in accordance with current and applicable contaminated site guidelines.	20 test pit locations (including 6 locations targeting fire incident area – see below) across Stage 1, Stage 2 and site stockpiles. 20 soil samples to be analysed for heavy metals, TRH, BTEX, PAH, OCP and PCB and asbestos (gravimetric). 10 soil samples for heavy metals, TRH, BTEX, PAH. 1 soil samples for pH, cation exchange capacity (CEC) and % clay.
Surface staining associated with leaks and spills from parked aircraft	Inhalation, dermal and ingestion during excavation works associated with construction and occupation.	Construction workers and future site occupants.	Areas of surface staining previously observed in unsealed areas surrounding the aviation museum.	Four surface grab samples across unsealed areas of aviation museum. 4 soil samples for TRH.

Potential AFFF use during fire incident (2003)	Inhalation, dermal and ingestion during excavation works associated with construction and occupation.	Construction workers, future site occupants and groundwater	PFAS may be present in areas within and surrounding the location of the fire incident.	6 test pit locations targeting the fire incident area. 6 soil samples for PFAS extended suite. 3 groundwater wells in the vicinity of the fire incident area (also targeting VOC from Boeing site – see below). 3 groundwater dissolved heavy metals, TRH, low level PAHs, VOCs and PFAS extended suite.
Potential PFAS from hydraulic leaks from planes	Inhalation, dermal and ingestion during excavation works associated with construction and occupation.	Construction workers, future site occupants and groundwater	PFAS from hydraulic leaks may be present in areas of former plane parking.	2 test pit locations (one location within aviation museum and one within former flying school plane parking areas within the western portion of the SWP). 2 soil samples for PFAS extended suite.
VOCs from Boeing Facility	Inhalation during occupation.	Future site occupants and groundwater	Solvent groundwater contamination known to be present on adjoining Boeing facility. Vapours could partition and accumulate in on-site structures (including services).	2 groundwater wells between the site boundary with the site and the Boeing facility. 3 groundwater dissolved heavy metals, TRH, low level PAHs, VOCs and PFAS extended suite.
Western portion of the SWP (not subject to previous investigations). Potential contamination from historical airport operations.	Inhalation, dermal and ingestion during excavation works associated with construction and occupation.	Construction workers, adjacent site users, future site occupants and groundwater.	Possible contamination from historical airport operations including flying schools and spray painting.	10 test pit locations. 10 soil samples to be analysed for heavy metals, TRH, BTEX, PAH, OCP and PCB and asbestos (gravimetric). 5 soil samples for heavy metals, TRH, BTEX, PAH. 1 soil samples for pH, cation exchange capacity (CEC) and % clay. 3 groundwater wells in the vicinity of the former spray painting facility. 3 groundwater dissolved heavy metals, TRH, low level PAHs, VOCs.

6. Investigation Methodology

The following information details the investigation methodology (based on the current level of information available for the site) to address the data gaps detailed in Section 3 in consideration of the proposed land use for the site (i.e. commercial / industrial).

Preparation of a Safe Work Method Statement (SWMS) that identifies foreseeable risks and provides strategies for removing and/or managing these risks. The SWMS would be submitted to BAL for approval prior to commencement of site works.

Underground service locating by a qualified service locator and Dial Before You Dig Search.

Excavation of test pits and boreholes within the SWP footprint to facilitate soil sampling and groundwater well installation. The numbers of test pit locations are detailed below:

- Test pits – 10 locations (western corner of SWP)
- Groundwater wells – 3 locations (western corner of SWP). It is proposed to utilize existing groundwater well (BAL-GW05) which is located adjacent to and down gradient of this area
- Test pits – 20 locations (remaining area of SWP)
- Surface samples – 4 locations around the aviation museum
- Groundwater wells – 3 locations (in the vicinity of the fire incident and the Boeing site).

Test pits locations will be positioned to target areas of interest (including potential PFAS source areas and hydrocarbon staining surrounding the aviation museum) and to provide general site coverage.

The proposed investigation locations are presented as Figure 1.

All test pits will be excavated to 3.0 m below ground level (bgl), intersection with the water table or excavation method refusal (whichever is shallower). Soil samples from test pits will be collected as grab samples from the surface of the site, directly from the centre of the excavator bucket at depths of approximately 0.5m and at 1.0m intervals or at other discrete locations where there is evidence of potential contamination (odorous or discoloured soils, erroneous waste or fill). Vapours within soil samples will also be screened for VOC using a hand held photoionization detector (PID).

With respect to the limited asbestos investigation from test pits, the following scope of works is proposed

- 10 litres of material excavated from 20 (on the SWP) and 10 (on the western corner of the SWP) test pit locations will be collected from both 0-1m and 1m-2m depth ranges. The 10 litre samples will be spread out on black plastic sheeting, raked and inspected for potential asbestos containing materials (ACM)

- Where potential ACM are identified within the 10 litre samples, all observable potential ACM will be collected and weighed.

- Where no potential ACM are identified in the 10 litre samples, a 500ml sample will be collected from material within the top 300mm of the test pit for NATA accredited laboratory identification.

Test pits within the fire incident area will additionally target the interface between the current fill placement and the underlying historical surface level (noting the fire incident occurred in 2003 prior to fill placement).

Surface samples from around the aviation museum (targeting leaks from planes) will be collected as grab samples directly from the surface of the site.

Boreholes will be drilled to facilitate construction of groundwater wells. Borehole locations will be positioned downgradient of the area where the fire incident was suspected of occurring, along the eastern boundary adjacent to the former Boeing facility, up and down gradient of the western corner of SWP.

Boreholes will be drilled with a rotary drill rig using solid flight augers. Boreholes will be drilled to a maximum depth of 10m bgl, 2m below the observed water table or excavation method refusal.

Groundwater wells will be constructed within each of the boreholes. Wells will be constructed using factory decontaminated Class 18 UPVC 50mm screens (to 1 m above the observed water table to allow for seasonal fluctuations) and casing (to ground level). The borehole annulus will be filled with graded sand to a level above the well screen and a bentonite/cement plug to ground level. The well will be capped with a lockable cap and finished flush with surrounding surface levels using a road box.

Groundwater wells will be developed following installation. and sampled in accordance with industry standard methods. Groundwater wells will be purged and sampled using low flow sampling techniques at least 48 hours after development. Groundwater levels and chemistry would be monitored during purging and samples only collected once water chemistry and levels have stabilised. Vapours within groundwater wells will also be screened for VOC using a hand held PID.

Test pit and borehole locations will be surveyed using a non-differential GPS. Heights of groundwater wells will be surveyed to site datum.

6.1.1 Laboratory Analysis

Soil and groundwater samples will be analysed by a National Association of Testing Authorities (NATA) accredited laboratory. Selected samples would be analysed for the following common contaminant compounds:

- 30 soil samples for heavy metals, TRH, BTEX, PAH, OCP and PCB and asbestos (gravimetric)
- 19 soil samples (15 primary + 4 QA/QC) for heavy metals, TRH, BTEX, PAH
- 4 soil samples for TRH (surface samples collected from areas surrounding the aviation museum only)
- 10 soil samples (8 primary + 2 QA/QC) for PFAS extended suite (in the vicinity of the fire incident and plane parking areas)
- 2 soil samples for pH, cation exchange capacity (CEC) and % clay
- 5 groundwater samples (3 primary + 2 QA/QC) for dissolved heavy metals, TRH, low level PAHs, VOCs and PFAS extended suite (in the vicinity of the fire incident and Boeing site)
- 3 groundwater samples for dissolved heavy metals, TRH, low level PAHs, VOCs (western corner of SWP only)
- 1 trip spike and trip blank per soil and groundwater laboratory batch.

6.1.2 Reporting

Jacobs will prepare an investigation report documenting the tasks completed, results and conclusions with respect to endorsed guidelines for commercial/industrial land use and the applicable limits specified within the NEPM (2013), AEPR (1997) and NEMP (2018) guidelines. The report will be prepared in general accordance with the

NSW EPA (1997) guidelines. The investigation report will utilise the information from previous investigations undertaken across the SWP.

The report will provide a statement as to whether the site, in is current state, is suitable or can be made suitable for the proposed commercial/industrial land use from a contamination perspective and will propose remediation required to make the site suitable, broad recommendations will be provided for remediation and/or management of contamination at the site in consideration of the commercial use of the SWP and surrounding areas.

Figures

Appendix A – Summary of Analytical Results

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL ^{5}	Airport Regulations – Areas of Environmental Significance ^{4}	Commercial / Industrial (D)	Airport Regulations			
CES (2005)										
Arsenic	263	<LOR to 166 mg/kg	160 ^{1}		20	3,000 ^{6}	500		5 > AEPR EIL 1 > NEPM EIL	
Cadmium	263	<LOR to 4 mg/kg	3 ^{2}		3	900 ^{6}	100		2 > AEPR EIL 2 > NEPM EIL	
Chromium	263	<LOR to 58 mg/kg	670 ^{3}		50	3,600 ^{6}	600,000		2 > AEPR EIL	
Copper	263	<LOR to 356 mg/kg	198.7 ^{3}		60	240,000 ^{6}	5,000		8 > AEPR EIL 2 > NEPM EIL	
Lead	263	<LOR to 419 mg/kg	1,810 ^{3}		300	1,500 ^{6}	1,500		1 > AEPR EIL	
Mercury	263	<LOR to 1.4 mg/kg	1 ^{2}		1	730 ^{6}	75		1 > AEPR EIL 1 > NEPM EIL	
Nickel	263	<LOR to 140 mg/kg	295 ^{3}		60	6,000 ^{6}	3,000		4 > AEPR EIL	
Zinc	263	<LOR to 790 mg/kg	425 ^{3}		200	400,000 ^{6}	35,000		5 > AEPR EIL	
DDT	120	<LOR	640 ^{1}		0.97		1,000			
Naphthalene	133	<LOR	370 ^{1}		-	11,000 ^{7}				
Total PCB	NA		-	-	1	7 ^{6}	50			
Aldrin	120	<LOR	-	-	0.05		50			
Dieldrin	120	<LOR	-	-	0.2		20			

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
F1 (C6 – C10)	132	NA		215	-	310 – 480 [8]		800		
F2 (>C10 – C16)	132	NA		170	-	20,000 [7]		1,000		
F3 (>C16 – C34)	132	NA		2,500	-	27,000 [7]		5,000		
F4 (>C34 – C40)	132	NA		6,600	-	38,000 [7]		10,000		
Benzene	132	<LOR		95	0.5	4-20 [8]	1			
Toluene	132	<LOR		135	3	99,000 [7]	130			
Ethylbenzene	132	<LOR		185	5	27,000 [7]	50			
Xylenes	132	<LOR		95	5	81,000 [7]	25			
Benzo(a)pyrene	133	<LOR to 3.6 mg/kg		0.7	-		5		5 > NEPM ESL	6 samples above LOR
TPH (C6 - C9)	132	<LOR to 8 mg/kg		-	100			800		4 samples above LOR
TPH (>C6)	133	<LOR to 920 mg/kg		-	1,000			5,000		
Total PAH	133	<LOR to 43.1mg/kg		-	5	4,000 [6]	100		6 > AEPR EIL	9 samples above LOR
Carcinogenic PAHs (as B(a)P TEQ)	NA	NA				40 [6]				
DDD + DDE + DDT	120	<LOR				3,600 [6]				
Aldrin and dieldrin	120	<LOR				45 [6]	20			
Dieldrin	120	<LOR					20			
Chlordane	120	<LOR to 0.3 mg/kg				530 [6]	250			
Endosulfan	120	<LOR				2,000 [6]				
Endrin	120	<LOR				100 [6]				

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
Heptachlor	120	<LOR				50 [6]	50			
HCB	120	<LOR				80 [6]				
Methoxychlor	120	<LOR				2,500 [6]				
Mirex	120	<LOR				100 [6]				
Toxaphene	120	<LOR				160 [6]				
Phenols	23	<LOR								
FA and AF	19	ND				0.001%				
ACM	19	ND				0.05%				
All forms of asbestos	19	ND				No visible asbestos in surface soils				
DLA (2009a)										
FA and AF	23	ND				0.001%				
ACM	10	Identified				0.05%				
All forms of asbestos	16	Identified				No visible asbestos in surface soils			16 surface locations	
DLA (2014)										
Arsenic	88	<LOR to 30 mg/kg	160 [1]		20	3,000 [6]	500		1 > AEPR EIL	
Cadmium	88	<LOR to 0.8 mg/kg	3 [2]		3	900 [6]	100			
Chromium	88	6 to 24 mg/kg	670 [3]		50	3,600 [6]	600,000			
Copper	88	6 to 46 mg/kg	198.7 [3]		60	240,000 [6]	5,000			

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
Lead	88	11 to 140 mg/kg	1,810 [3]		300	1,500 [6]	1,500			
Mercury	88	<LOR to 5 mg/kg	1 [2]		1	730 [6]	75		1 > AEPR EIL 1 > NEPM EIL	
Nickel	88	4 to 35 mg/kg	295 [3]		60	6,000 [6]	3,000			
Zinc	88	18 to 410 mg/kg	425 [3]		200	400,000 [6]	35,000		1 > AEPR EIL	
DDT	32	<LOR	640 [1]		0.97		1,000			
Naphthalene	88	<LOR	370 [1]		-	11,000 [7]				
Total PCB	32	<LOR	-	-	1	7 [6]	50			
Aldrin	32	<LOR	-	-	0.05		50			
Dieldrin	32	<LOR	-	-	0.2		20			
F1 (C6 – C10)	88	<LOR		215	-	310 – 480 [8]		800		
F2 (>C10 – C16)	88	<LOR		170	-	20,000 [7]		1,000		
F3 (>C16 – C34)	88	<LOR to 610		2,500	-	27,000 [7]		5,000		3 samples above LOR
F4 (>C34 – C40)	88	<LOR to 150		6,600	-	38,000 [7]		10,000		3 samples above LOR
Benzene	88	<LOR		95	0.5	4-20 [8]	1			
Toluene	88	<LOR		135	3	99,000 [7]	130			
Ethylbenzene	88	<LOR		185	5	27,000 [7]	50			
Xylenes	88	<LOR		95	5	81,000 [7]	25			
Benzo(a)pyrene	88	<LOR to 17 mg/kg		0.7	-		5		2 > NEPM ESL 1 > AEPR HIL	84 samples above LOR

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
TPH (C6 - C9)	88	<LOR		-	100			800		
Total PAH	88	<LOR to 190 mg/kg		-	5	4,000 [6]	100		12 > AEPR EIL 1 > AEPR HIL	87 samples above LOR
Carcinogenic PAHs (as B(a)P TEQ)	88	<LOR to 17mg/kg				40 [6]				
DDD + DDE + DDT	32	<LOR				3,600 [6]				
Aldrin and dieldrin	32	<LOR				45 [6]	20			
Dieldrin	32	<LOR					20			
Chlordane	32	<LOR				530 [6]	250			
Endosulfan	32	<LOR				2,000 [6]				
Endrin	32	<LOR				100 [6]				
Heptachlor	32	<LOR				50 [6]	50			
HCB	32	<LOR				80 [6]				
Methoxychlor	32	<LOR				2,500 [6]				
Mirex	32	<LOR				100 [6]				
Toxaphene	32	<LOR				160 [6]				
FA and AF	11	ND				0.001%				
ACM	11	Detected				0.05%			2 samples of ACM	
All forms of asbestos	11	Detected				No visible asbestos in surface soils			2 samples of ACM	
DLA (2015)										
Arsenic	34	5 to 11 mg/kg	160 [1]		20	3,000 [6]	500			
Cadmium	34	0.4 to 0.9 mg/kg	3 [2]		3	900 [6]	100			

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
Chromium	34	10 to 24 mg/kg	670 [3]		50	3,600 [6]	600,000			
Copper	34	23 to 42 mg/kg	198.7 [3]		60	240,000 [6]	5,000			
Lead	34	27 to 70 mg/kg	1,810 [3]		300	1,500 [6]	1,500			
Mercury	34	<LOR to 0.1 mg/kg	1 [2]		1	730 [6]	75			
Nickel	34	8 to 27 mg/kg	295 [3]		60	6,000 [6]	3,000			
Zinc	34	47 to 130 mg/kg	425 [3]		200	400,000 [6]	35,000			
DDT	34	<LOR	640 [1]		0.97		1,000			
Naphthalene	34	<LOR	370 [1]		-	11,000 [7]				
Total PCB	34	<LOR	-	-	1	7 [6]	50			
Aldrin	34	<LOR	-	-	0.05		50			
Dieldrin	34	<LOR	-	-	0.2		20			
F1 (C6 – C10)	34	<LOR		215	-	310 – 480 [8]		800		
F2 (>C10 – C16)	34	<LOR		170	-	20,000 [7]		1,000		
F3 (>C16 – C34)	34	<LOR to 310		2,500	-	27,000 [7]		5,000		12 samples above LOR
F4 (>C34 – C40)	34	<LOR to 350		6,600	-	38,000 [7]		10,000		7 samples above LOR
Benzene	34	<LOR		95	0.5	4-20 [8]	1			
Toluene	34	<LOR		135	3	99,000 [7]	130			

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
Ethylbenzene	34	<LOR		185	5	27,000 [7]	50			
Xylenes	34	<LOR		95	5	81,000 [7]	25			
Benzo(a)pyrene	34	<LOR to 17 mg/kg		0.7	-		5		4 > NEPM ESL	34 samples above LOR
TPH (C6 - C9)	34	<LOR		-	100			800		
Total PAH	34	<LOR to 16 mg/kg		-	5	4,000 [6]	100		10 > AEPR EIL	34 samples above LOR
Carcinogenic PAHs (as B(a)P TEQ)	34	<LOR to 1.3 mg/kg				40 [6]				
DDD + DDE + DDT	34	<LOR				3,600 [6]				
Aldrin and dieldrin	34	<LOR				45 [6]	20			
Dieldrin	34	<LOR					20			
Chlordane	34	<LOR				530 [6]	250			
Endosulfan	34	<LOR				2,000 [6]				
Endrin	34	<LOR				100 [6]				
Heptachlor	34	<LOR				50 [6]	50			
HCB	34	<LOR				80 [6]				
Methoxychlor	34	<LOR				2,500 [6]				
Mirex	34	<LOR				100 [6]				
Toxaphene	34	<LOR				160 [6]				
FA and AF	26	ND to 0.0061%				0.001%				AF/FA identified in one sample only
ACM	26	Detected				0.05%			5 samples of ACM	

Substance	Number of Samples Analysed	Concentration Range	Ecological			Human Health		Management Limits	Exceedances	Comments
			NEPM EIL	NEPM ESL [5]	Airport Regulations – Areas of Environmental Significance [4]	Commercial / Industrial (D)	Airport Regulations			
All forms of asbestos	26	Detected				No visible asbestos in surface soils			5 samples of ACM	

[1] Generic EILs for aged arsenic/DDT/Naphthalene from Table 1B(5).

[2] EILs from NEPM 1999 (no EILs specified for contaminants in NEPM 2013).

[3] EILs derived from NEPM 2013 equation ABC+ACL.

[4] Levels from the Airport Regulations Table 2 – areas of environmental significance

[5] Table 1B(6) ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)pyrene in soils - NEPM (2013).

[6] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[7] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E

[8] NEPC (2013) Table 1A(3) Soil HSLs for Vapour Intrusion (mg/kg) HSL D Commercial / Industrial.

Document 3

Preliminary PFAS Risk Assessment for Bankstown Airport

Sydney Metro Airports

IA115500 | FINAL

9 January, 2017

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Contents

Executive Summary

Sydney Metro Airports (SMA), the lease holder and operator of Bankstown and Camden Airports, has engaged Jacobs to undertake a preliminary risk assessment of per- and polyfluoroalkyl substances (PFAS) land contamination at Bankstown Airport (the Airport). This report presents the scope of work, findings and recommendations from the risk assessment.

PFAS are a large group of compounds consisting of a fully fluorinated hydrophobic alkyl chain of varying length (typically 4 to 16 carbon atoms) and a hydrophilic end group. In the past, PFAS were often referred to as “PFCs” (per- and polyfluorinated chemicals). However the term PFAS is now used by regulators in Australia. PFAS are emerging contaminants and their sources, fate and transport and toxicity is still not well understood. Similarly, the regulatory framework for the characterisation, assessment and management of risks associated with PFAS is also under development.

A number of potential PFAS sources have been identified at the Airport. The most significant suspected source is associated with the historic use of Aqueous Film Forming Foam (AFFF) containing PFAS at the former fire training ground. However AFFF was also used for fire fighting during fire incidents and for fire training at other locations around the Airport. It is understood that 3M Lightwater was the main AFFF product used at the airport and perfluorooctane sulfonate (PFOS) is the primary PFAS of concern in this product.

Other potential sources of PFAS contamination at the Airport include the storage and use of aviation hydraulic fluid across the Airport, the potential historic use of mist suppressants in plating and other metal processing activities in the former Boeing area and the waste landfills at the Airport. It is noted that no information confirming the use of hydraulic fluids or mist suppressants which contained PFAS has been obtained. Furthermore, unlike the use of AFFF which was applied in large volumes directly to ground surfaces, sub-surface impacts from hydraulic fluid and mist suppressants would only have occurred through spills or leaks. Groundwater monitoring around the landfills at the Airport has not detected any significant emissions of PFAS from the landfills to groundwater. Therefore these sources are considered to present a less significant risk than AFFF use.

The Aviation Rescue and Fire Fighting (ARFF) service at the Airport ceased in 1991 and since then fire response services have been provided by NSW Fire & Rescue (off-site). The only current storage or use of PFAS products at the Airport that has been identified during this assessment is the storage of AFFF for emergency use at the Turbomeca engine test cell facility. The AFFF is used in a fixed fire suppression system and is stored in a 200 litre capacity stainless steel above ground tank. The AFFF product contains C6 chain PFAS which are thought to be less persistent and less toxic than PFOS based AFFF products.

A number of soil, surface water and groundwater investigations and monitoring programs have been undertaken at the Airport and these have recently included analysis of PFAS. The programs have not specifically targeted PFAS source areas. However minor concentrations of PFOS and to a lesser extent perfluorooctanoic acid (PFOA) and 6:2 fluorotelomer sulfonate (6:2 FTS) have been reported.

There is no known beneficial use of groundwater at the Airport or immediately hydraulically down gradient. However further data is needed to confirm that the registered well at the residential property on Rickard Rd is not used for drinking water purposes and / or is not influenced by shallow groundwater from the Airport. The most significant exposure pathways are more likely to be human direct contact with PFAS impacted soil at the Airport and exposure to ecological receptors in the Georges River via surface water and groundwater migration from the Airport. While the region of the Georges River where surface water and groundwater from the Airport would discharge is likely to be impacted by other urban contaminants, the advice from Department of Primary Industries against eating fish or shell fish from the Georges River applies upstream of the discharge area. Therefore the potential for people to consume fish impacted by PFAS migration (if present) from the Airport may need to be further assessed.

None of the investigation or monitoring data reviewed as part of this preliminary risk assessment indicates an immediate risk of harm to human health or the environment. Based on the maximum concentrations of PFOS in on-site surface water and on-site groundwater at the Airport, the site would be classified as Priority 2 under the

NSW EPA Decision Tree. The NSW EPA Decision Tree states that Priority 2 sites are to be further investigated once investigations at Priority 1 sites are completed.

In order to further assess and manage the risks identified in this preliminary assessment, the following recommendations are made:

1) **Investigation of the former fire training area**. A soil and groundwater investigation of the former fire training area is recommended in order to assess the magnitude and extent of PFAS impacts, if any.

1) **Changes to the current water quality monitoring program.** A separate review of the current groundwater monitoring program for the Airport recommended expansion of the current groundwater monitoring network to assess up-gradient and down-gradient groundwater quality. One of the proposed groundwater monitoring well locations was downgradient of the former Sewerage Treatment Plant which is also the location of the former fire training ground. Changes to the current surface water monitoring locations were also recommended including the addition of monitoring in the Georges River. These recommendations are considered relevant based on this preliminary PFAS risk assessment. However it is further recommended that the analysis suites for PFAS are broadened. Analysis costs have fallen over the past 12 months and most labs offer a more comprehensive suite of PFAS compounds that has previously been used for the Airport. As a minimum, perfluorohexane sulfonic acid (PFHxS) should be included in all future PFAS analysis in order to be able to assess concentrations against the enHealth interim criteria.

2) **Current storage of AFFF (C6 chain) for emergency use at the Turbomeca facility**. The AFFF system at the Turbomeca is used in an enclosed helicopter engine test bay with a closed drainage system. If the AFFF was to be used, the foam and water would drain to a holding tank that could be pumped out for appropriate disposal off-site. The drainage system and holding tank is periodically inspected by Turbomeca to ensure it’s integrity. The AFFF is stored in an above ground stainless steel tank with clearance between the base of the tank and the concrete floor slab. Any leaks from the tank would therefore likely be detected. No changes to the current system are recommended. However, when the current AFFF product is due for replacement, it is recommended that SMA ensure a review is undertaken and where feasible, the foam should be replaced with a fluorine free foam. Further guidance on environmental issues regarding the ongoing use of AFFF can be obtained from the Queensland Government’s Environmental Management of Firefighting Foam Policy (QLD DEHP, 2016).

3) **Aviation hydraulic fluid.** A review of the aviation hydraulic fluid products historically and currently used at the Airport is recommended. The review should aim to determine if the products used contained PFAS, the main PFAS compounds and approximate percentage content. Should this review identify that PFAS containing products have been used then the significance of this source in the conceptual site model may need to be revised.

4) **GEMS 002 PFC – management actions advice**. For the purposes of GEMS 002, this Preliminary PFAS Risk Assessment could be used as a Trigger Assessment for new activities at the Airport. For activities that will be located in or in the vicinity of the identified potential PFAS source areas, Preliminary and Detailed Site Investigations in accordance with Schedule A of the NEPM should be undertaken. For activities located outside these areas, the risk of significant PFAS contamination to be present is considered low and further investigation is not considered necessary. However, should a detailed site investigation be undertaken for other reasons (ie. potential presence of non-PFAS contaminants) then it is recommended that PFAS compounds are included in the laboratory analysis suites. Additional data on PFAS concentrations in soil, groundwater or surface water at the Airport should be compiled to support updates to the Conceptual Site Model and revisions of the risk assessment in the future.

Important note about your report

The sole purpose of this report is to present the findings of a Preliminary Per- and Polyfluoroalkyl Substances Risk Assessment at Bankstown Airport carried out by Jacobs for Sydney Metro Airports (‘the Client’). This report was produced in accordance with and is limited to the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

The scope of services was not intended to provide a definitive or quantitative investigation of the environmental impacts, performance and compliance of the subject site. Environmental conditions may exist at the site that are beyond the scope of our investigations and this report.

The findings presented in this report are professional opinions based solely upon information and data provided or made available by the Client or otherwise available in the public domain between 28 May, 2016 and 21 November, 2016.

Jacobs has relied upon and presumed that this data is accurate and representative of the conditions at the site. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete or if site conditions change beyond the above dates then it is possible that our conclusions as expressed this report may change. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable at the time of this report may in the future become subject to different regulatory standards and require assessment.

Opinions and judgements expressed in the report are based on Jacobs’ understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

Except as specifically stated in this report, Jacobs makes no statement or representation of any kind concerning the suitability of the site for any purpose or the permissibility of any use.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of the Client, and is subject to and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

Sydney Metro Airports (SMA) has been the lease holder and operator of Bankstown Airport (the Airport) since December, 2003. The Airport property is owned by the Commonwealth and the management of environmental matters on the Airport is regulated under the *Airports Act 1996* and the *Airports (Environment Protection) Regulations 1997*.

Historical activities at the Airport have included the use of Aqueous Film Forming Foams (AFFF) for fire fighting and fire training purposes. At least one of the foam types historically used at the Airport, 3M Lightwater, contained per- and polyfluoroalkyl substances (PFAS). Other activities at the Airport may also have involved the use of products containing PFAS. These chemicals have been identified as presenting potential risks to human health and the environment.

SMA has engaged Jacobs Group (Australia) Pty Ltd (Jacobs) to undertake a preliminary risk assessment of PFAS at the Airport. This report presents the scope of work, findings and recommendations from the risk assessment.

1.1 Scope of work

The risk assessment was limited to:

- an assessment of the potential for PFAS to be present in soil, groundwater or surface water at the Airport; and,
- an assessment of whether PFAS in soil, groundwater or surface water, if present, could present a risk to human health or the environment.

The scope of work involved a desktop assessment and brief site reconnaissance only. No environmental sampling was undertaken as part of this assessment.

The scope of work performed included:

- Identification of potential sources of PFAS at the Airport through a review of SMA and tenant activities and submission of information requests to the Department of Infrastructure and Regional Development (DIRD), Airservices Australia and the NSW Fire Brigade.
- A review of the Airport site setting including topography, geology, hydrogeology and hydrology to identify potential PFAS transport pathways.
- Identification of potential receptors to PFAS contamination including on-site and off-site human receptors and on-site and off-site ecological receptors.
- Review of existing soil, groundwater and surface water data at the Airport relating to PFAS contamination.
- Development of a preliminary conceptual site model and a qualitative assessment of PFAS risks.
- Recommendations for further investigation and / or risk management measures as appropriate.

2. Background on Per- and Polyfluoroalkyl substances (PFAS)

2.1 Terminology

PFAS are a large group of compounds consisting of a fully fluorinated hydrophobic alkyl chain of varying length (typically 4 to 16 carbon atoms) and a hydrophilic end group (DER, 2016). In the past, PFAS were often referred to as “PFCs” (per- and polyfluorinated chemicals), but this term can also be understood as perfluorocarbons which contain only carbon and fluorine and have properties and functionalities different from those of PFAS (OECD, 2013).

PFAS and their derivatives are man-made chemicals and have been used in a wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware (although not added to the finished cookware), specialised garments and textiles, Scotchgard™ and similar products (used to protect fabric, furniture, and carpets from stains), metal plating and in some types of fire-fighting foam (NICNAS, 2016).

There are two main groups of PFAS used in industry (NICNAS, 2016):

- perfluoroalkyl sulfonic acids (PFSA) group, including chemicals such as perfluorooctane sulfonate (PFOS)
- the perfluorocarboxylic acid (PFCA) group, including chemicals such as perfluorooctanoic acid (PFOA).

Various organisations have used the term PFCs in the past. However, the US EPA is now utilising the term PFAS to collectively describe PFOA, PFOS and the other chemicals in these groups (US EPA, 2016). The Environmental Health Standing Committee of the Australian Health Protection Principal Committee (enHealth) now refers to this group of chemicals as PFAS (enHealth, 2016) and other Australian regulatory authorities appear to be following this direction.

2.2 Sources of PFAS

PFAS are man made chemicals that have been used since the 1950s. They are resistant to heat, oil, grease, water and acids and this, combined with their surfactant properties, have made them useful for a wide variety of applications.

While PFAS has not been manufactured in Australia, PFOS was a component of the Scotchgard™ and Scotchban™ range of products supplied by the 3M Company. Scotchgard™ was used in commercial / industrial applications in Australia for protecting textiles and leather. Scotchban™ was used to treat paper containers for fast-food and pet-food. Other products containing PFAS that were used in Australia include Aqueous Film Forming fire fighting Foams (AFFF) and Alcohol-Type Concentrate (ATC) fire fighting foams, industrial coating products, rubber moulding products and acid mist suppressants. (NICNAS, 2013)

The salts of PFSAs (primarily PFOS) have been used as additives with a content of about or less than 0.1% in aviation hydraulic fluids to prevent evaporation, fires and corrosion (OECD, 2013).

Non-polymeric PFAS (such as the potassium, lithium, diethanolamine and ammonium salts of PFOS or 6:2 fluorotelomer sulfonate) have been used as surfactants, wetting agents and mist suppressing agents for both decorative chrome plating and hard chrome plating processes. Recent technology development on using chromium (III) instead of chromium (VI) has made PFOS use in decorative chrome plating obsolete. For hard plating, chromium (III) does not work, and PFOS is still used for this application (OECD, 2013).

The 3M Company stopped manufacturing PFOS chemicals in December 2000 and reformulated all Scotchgard products replacing PFOS with other short-chain PFASs (NICNAS, 2016). Many PFOS containing products were phased out in Australia in December, 2013 (NICNAS, 2013). However in many cases, products containing the C-8 chain PFAS such as PFOS and PFOA have been replaced by products with shorter chain PFAS. For example manufacturers of aqueous film forming foams AFFF have been replacing long-chain fluorosurfactants based on PFOS or PFOA derivatives/precursors with shorter-chain fluorosurfactants based on perfluorobutane sulfonate (PFBS) and perfluorohexane sulfonic acid (PFHxS) (Danish Environmental Protection Agency, 2015).

2.3 Fate and transport

PFAS includes thousands of compounds and the fate and transport of these compounds in the environment is not well understood. In general terms, PFAS are known to be persistent, bioaccumulative and toxic and, due to their persistence in the environment and moderate solubility, can be transported long distances (potentially kilometres) in water and air, and transfer between different media (e.g. soil, sediment, surface water and groundwater) (DER, 2016).

Over the pH range normally found in soil, groundwater and surface waters (pH 5-9) PFAS are normally present as anions, and this reduces sorption by soils and sediments, which usually carry a net negative charge. Their retardation during transport in groundwater increases with perfluorocarbon chain length and the fraction of organic carbon in the soil, with PFSAs binding more strongly than PFCAs of the same carbon number. Vapour migration plays only a minor role in assessing the mobility of most PFAS in the environment due to the low to very low vapour pressure of the PFAS. (Concawe, 2016)

While PFAS are generally considered to be recalcitrant to biodegradation via naturally-occurring microorganisms in water or soil, precursors are known to be transformed into PFAS under natural circumstances (Concawe, 2016). Therefore, DER (2016) recommends that the potential for precursor transformation to PFOS and PFOA and other PFAS metabolites should be considered in the overall potential for environmental and human exposure and evaluation of risk to human health, the environment and environmental values when assessing site contamination caused by PFAS.

2.4 Exposure and toxicity

enHealth (2016) notes that because of their widespread use, most people in Australia will have some PFOS and PFOA in their body. PFOS and PFOA are readily absorbed through the gut, and once these chemicals are in a person’s body it takes about two to nine years, depending on the study, before those levels go down by half, even if no more is taken in. Outside of the occupational setting, exposure to PFAS can occur from the air, indoor dust, food, water and various consumer products. For most people food is expected to be the primary source of exposure to PFOS and PFOA. Human breast milk may contribute to exposure in infants since PFCs have been detected in human breast milk. For some communities near facilities where PFOS and PFOA have been extensively used, higher levels may be found in the surrounding environment and exposure may occur through other means, including drinking water supplied from groundwater containing PFOS and PFOA..

Studies on laboratory animals exposed to high levels of PFAS have indicated changes in the liver, thyroid, and pancreatic function, as well as some changes in hormone levels. Some, but not all studies in humans have shown that certain PFAS may:

- affect the developing foetus and child, including possible changes in growth, learning, and behaviour;
- decrease fertility and interfere with the body’s natural hormones;
- increase cholesterol;
- affect the immune system; and,
- increase cancer risk. (ATSDR, 2016)

As noted in Section 2.2, many products containing C-8 chain PFAS have been replaced by shorter chain PFAS. While these are thought to be less toxic, there is a general lack of toxicological information regarding the short-chain PFAS other than PFHxS. Similarly there is very little information on the environmental fate and transport of short-chain PFAS. (Danish Environmental Protection Agency, 2015)

2.5 Regulatory framework

Regulators around the world have introduced restrictions on the manufacture, import and use of certain types of PFAS since the early 2000's. As noted in Section 2.2, many types of PFOS containing products were prohibited in Australia from 2003.

However the Commonwealth and State regulatory framework for the management of PFAS impacts to land is still developing. There are no screening guideline values for PFAS included in the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 (NEPM). There are no specific published NSW EPA guidelines or requirements for the assessment of PFAS impacts or for the disposal of PFAS impacted waste in NSW. The *Airports (Environment Protection) Regulation 1997* does not provide trigger levels for PFAS in soil or groundwater.

In May, 2015, the Department of Defence issued Interim Screening Criteria for Perfluorooctanesulfonate (PFOS), Perfluorooctanesulfonic acid (PFOA) and 6:2 fluorotelomer sulfonate (6:2FTS) (Defence, 2015). These compounds are PFAS that are commonly present in certain types of AFFF.

In March, 2015, the Department of Infrastructure and Regional Development published the Guideline for Environmental Management 002 "PFC – management actions advice" (GEM 002) (DIRD, 2015). This document is discussed further in Section 2.5.1.

In June, 2015, Airservices Australia commissioned GHD to prepare the report "Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework" (GHD, 2015) which also provides background on the potential presence, transport mechanisms and risks associated with PFAS and presented a recommended management strategy for PFAS impacted land.

The Western Australian Department of Environmental Regulation published "Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Contaminated Sites Guidelines" in February, 2016 (DER, 2016). This document provides recommendations on the assessment, management and remediation of PFAS impacted sites.

enHealth published "Interim national guidance on human health reference values for per- and poly-fluoroalkyl substances for use in site investigations in Australia" in June, 2016 (enHealth, 2016). This guidance provides recommended Tolerable Daily Intake values, Drinking Water Quality Guidelines values and Recreational Water Quality Guideline values for the sum of PFOS and perfluorohexane sulfonate (PFHxS) as well as PFOA.

The QLD Department of Environment and Heritage Protection published the "Operational Policy for the Environmental Management of Fire Fighting Foam" in July, 2016 (DEHP, 2016). This policy sets out requirements for fire fighting foams or materials contaminated with fire fighting foams in Queensland. Under this policy, foams containing PFOS or PFOA and it's precursors must be withdrawn from service. C6 chain flourotelemer foams can be used under certain conditions.

A summary of published guideline values for PFAS in soil, surface water and groundwater is provided in Table 1 on the following page.

Table 1 : Summary of selected Australian PFAS guideline values

Exposure scenario	PFOS	PFOS + PFHxS	PFOA	6:2 FTS
Tolerable Daily Intake (µg/kg/d)		0.15[1]	1.5[1]	
Drinking Water Quality Guideline (µg/L)	0.2[2,5,6]	0.5[1]	5[1] 0.4[2,5,6]	5[2,5,6]
Recreational Water Quality Guideline (µg/L)	2[6]	5[1]	50[1] 4[6]	50[6]
Ecological – freshwater (High conservation value – 99% species protection) (µg/L)	0.00023[3]		19[3]	
Ecological – freshwater (Slightly – moderately disturbed ecosystems – 95% species protection) (µg/L)	0.13[3] 6.66[5,6]		220[3] 2900[5,6]	
Ecological – freshwater (Highly disturbed ecosystems – 90% species protection) (µg/L)	2[3]		632[3]	
Ecological – freshwater (Highly disturbed ecosystems – 80% species protection) (µg/L)	31[3]		1,824[3]	
Soil – human health residential (mg/kg)	4[4] 6[5,6]		16[5,6]	60[5,6]
Soil – human health industrial / commercial (mg/kg)	100[4] 90[5,6]		240[5,6]	900[5,6]
Soil – ecological terrestrial (mg/kg)	0.373 – 4.71[5,6]		3.73[5,6]	
Surface water – human health consumption of fish (ng/L)	0.65[5,6]		300[5,6]	6.5[5,6]

Sources:

[1] enHealth (2016)

[2] Defence (2016) based on US EPA provisional guidance.

[3] Draft Australian and New Zealand Water Quality Guidelines applicable to aquatic organisms as published in DER (2016)

[4] DER (2016)

[5] Airservices Australia Guidance (GHD 2015)

[6] Defence (2016) based on US EPA Region 4 guidance.

2.5.1 GEM 002 – PFC – management actions advice

GEM 002 – PFC Management Actions Advice (DIRD, 2016) provides a guide to operators of undertakings at federal leased airports on the reasonable and practicable management of PFAS which may be encountered during building activities. GEM 002 was applicable until 30 June, 2016 and SMA has been advised by DIRD that it should still be applied.

The guidance recommends that a Trigger Assessment is conducted to determine if there is a likelihood of known or potential PFAS contaminating activities occurring (presently or in the past) on or in the vicinity of the building activity site. If the Trigger Assessment identifies a likelihood of known or potential contamination then a Preliminary Site Investigation should be conducted as per Schedule A of the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended in 2013 (referred to as the NEPM) (NEPC, 2013).

Where the Preliminary Site Investigation indicates there is reason to expect PFAS contamination or there is not sufficient information to determine otherwise, then a Detailed Site Investigation should be conducted in accordance with Schedule A of the NEPM.

2.5.2 NSW EPA Decision Tree for Prioritising Sites Potentially Contaminated with PFASs

The NSW EPA commissioned Environmental Risk Sciences Pty Ltd (enEiskS) to prepare a decision tree for prioritising sites potentially contaminated with PFAS (hereafter referred to as the NSW EPA Decision Tree) (enRiskS, 2016). The NSW EPA Decision Tree states that an initial screening assessment involving collection of surface water, groundwater and soil samples is to be undertaken at each potentially impacted site, in the areas of the site most potentially impacted.

Trigger points have been defined based on total PFAS concentrations in the collected samples. Based on these trigger points, a site is classified as either one of the following priority levels:

- **Priority 1** sites where PFAS concentrations are elevated and there is a pathway by which people or the environment can be exposed to the contamination. Detailed investigations are to be carried out on these sites as soon as possible and short term management options to reduce the risks associated with the contamination may also be needed.
- **Priority 2** sites are those where PFAS is present above screening guidelines but at lower concentrations than Priority 1 sites. Detailed investigations of these sites are to be performed following the Priority 1 sites.
- **Priority 3** sites are those sites where PFAS concentrations are not detected or are detected below the relevant thresholds. These sites are unlikely to need further investigation but a final decision on the need for such an investigation is to be confirmed once the Australian guidelines for these chemicals are finalised.

The trigger point values are summarised in Table 2 below.

Table 2 : NSW EPA Decision Tree trigger point values (summarised from enRiskS, 2016)

Trigger point descriptor	Surface water	Groundwater	Soil leachate
Trigger Point 1 Elevated contamination	10 µg/L	10 µg/L	100 µg/L
Trigger Point 2 Current screening guideline	0.1 µg/L	0.1 µg/L	1 µg/L
Trigger Point 3 Low level of contamination	0.05 µg/L	0.05 µg/L	-
Limit of Reporting as at February, 2016	0.01-0.05 µg/L	0.01-0.05 µg/L	-

For surface water and groundwater samples, Priority 1 sites are those where on-site results are above Trigger Point 1 or where off-site results exceed Trigger Point 2. Priority 2 sites are those where on-site results are between Trigger Point 1 and Trigger Point 3 or off-site results are between Trigger Point 2 and Trigger Point 3. Priority 3 sites are those where on or off-site results are below Trigger Point 3.

For soil leachate samples, Priority 1 sites are those where results are above Trigger Point 1. Priority 2 sites are those with results between Trigger Point 1 and Trigger Point 2. Priority 3 sites are those with results below Trigger Point 2.

3. Site setting

3.1 Overview

The Airport consists of approximately 313 hectares of commonwealth land located approximately 25 km from the Sydney central business district (CBD). The Airport has three parallel runways, a Helicopter Landing Site and an extensive taxiway system. There are both hardstand and grass areas for aircraft parking as well as 90 separate hangar structures. Not all hangars are used for aircraft storage. Additional activities taking place within the hangar buildings include aircraft maintenance, flying schools, executive flight operations, and air freight. Most of the hangars have annexes or space for supporting ancillary activities such as offices, classrooms, storage, workshops, toilets and kitchens (SMA, 2014).

SMA has approximately 150 tenants at the Airport. The tenant activities can be broadly categorised as:

1) Aviation – flying schools, emergency services, freight, aircraft maintenance, scenic flights and aircraft couriers;
2) Aviation-related – light aviation manufacturing, servicing and repairs and industry supply chain activities; and,
3) General commercial and industrial – fast food retailers, supermarket, service station, logistics, facilities, financial services organisations, manufacturing, commercial offices, telecommunications infrastructure and educational facilities (SMA, 2014).

A general site layout plan is provided as **Appendix A, Figure A1**.

3.2 Surrounding properties

Milperra Road is located adjacent to the southern boundary of the Airport property. Bankstown Golf Club and various industrial activities are located further south of Milperra Rd.

The land to the east of the northern section of the eastern Airport property boundary is used for light industrial activities. Condell Park High School is located about 300 meters east of the Airport's eastern boundary. There are also several recreational areas east of the southern section of the Airport's eastern boundary. Residential properties are located further to the east.

Marion Street is located adjacent to the northern Airport boundary. The land further north of Marion Street is predominantly residential.

Georges River Golf Course is located west of the Airport's western boundary with other recreational areas (e.g. tennis courts) located north of the golf course. Henry Lawson Drive is located west of the golf course with the Georges River west of Henry Lawson Drive.

The main surrounding land uses are noted on **Appendix A, Figure A1**.

3.3 Topography and hydrology

The Airport land is generally flat with elevation rising from approximately 3 meters Australian Height Datum (AHD) in the south to approximately 5 meters AHD in the north.

The Airport is part of the Milperra Catchment which drains surface water to the Georges River. Stormwater from higher areas north east of the Airport as well as from the Airport property is directed to the Georges River through underground pipes, open channels and culverts as indicated in **Figure 1** below.

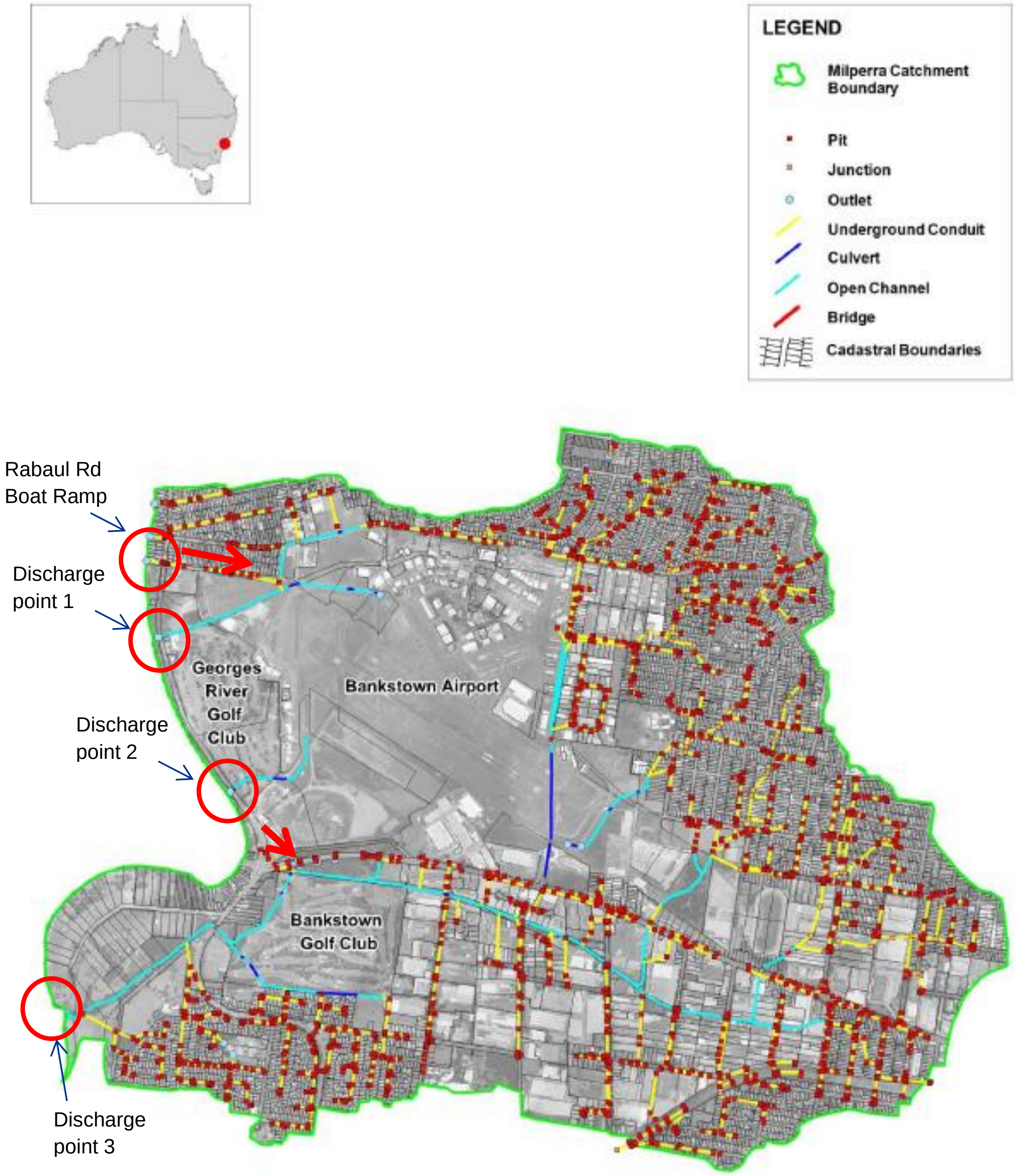


Figure 1 : Stormwater drainage network for the Milperra Catchment. Note red arrows indicate assumed flow direction (BMT WBM, 2013 with mark-ups by Jacobs)

The Georges River is split into two different sections by the Liverpool Weir, located near Liverpool Train Station. The section upstream of the weir is freshwater while downstream is saltwater and tidal. The Georges River and its tributaries form a vertically well-mixed estuary with waters in the lower reaches having essentially marine salinities. It is therefore considered more appropriate to compare water quality monitoring results against the limits for marine water, rather than fresh water.

The NSW DECCW (2006) defines water quality objectives (WQO) for the Georges River. The areas surrounding the Georges River in the near vicinity of the Airport are characterised by urban developments. The NSW

DECCW (2006) states that the WQO for the Georges River affected by urban development should be selected to protect aquatic ecosystems and recreational contact (both primary and secondary). It is noted in NSW DECCW (2006) that these WQOs may not be achievable in the short term and that the protection of primary recreational users may not be achievable.

The Georges River is highly influenced by inputs from the surrounding urbanised catchment, and although a fishing ban is not in place on the Georges River, the NSW Department of Primary Industries (Fishing and Aquaculture) recommend that fish and shellfish caught in the tidal waters of the Georges River and its tributaries, upstream from Rabaul Road boat ramp at Georges Hall (west of the Airport) to Liverpool Weir should not be eaten due to high levels of pollutants being found in these waters (DPI, 2016). However surface water and groundwater discharges from the Airport to the Georges River would occur south of the Rabaul Road boat ramp and therefore the recommendation on consumption of fish and shell fish would not apply. Oysters cannot be taken anywhere in the Georges River (DPI, 2016).

3.4 Soils and geology

Review of the 1:100,000 Penrith Soil Landscape Series Sheet 9030 (Soil Conservation Service of NSW, 1989) indicated that the area in which the Airport is located has been disturbed by human activity to a depth of at least 100 cm. The original soil has been removed, greatly disturbed or buried. Most of these areas have been levelled to slopes of less than 5%. Landfill includes soil, rock, building and waste materials. The original vegetation has been completely cleared.

The natural soils underlying these disturbed areas consist of fluvial sediments of the Berkshire group of soils. The Berkshire group of fluvial sediments are typically characterised by orange heavy clays and clayey sands, often mottled and with ironstone inclusions. Due to the depositional action of the fluvial sediments, they can exhibit marked differences in soil texture, colour, stoniness and calcium carbonate content.

Review of the 1:100,000 Penrith Geological Sheet 9030 (Geological Survey of NSW, 1991) indicated the Airport is within an area underlain by fluvial sediments. The sediments overlie Ashfield Shale of the Wianamatta Group. The fluvial sediments comprise clayey quartzose sand and clay. The Ashfield Shale comprises dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite.

3.5 Hydrogeology

Regional groundwater flow at the Airport is expected to be towards the Georges River, west and south-west of the Airport. Shallow groundwater is expected to be perched above the residual weathered bedrock and to be recharged predominantly by the infiltration of surface water falling onto the unsealed surfaces of the site.

3.5.1 Beneficial use of groundwater

SMA has advised that there is currently no beneficial use of groundwater at the Airport.

At the time of preparing this risk assessment, Jacobs conducted a search of the Office of Water groundwater database. There were no registered wells identified within the Airport property. Two registered wells (GW106700 and GW047864) were located in the Georges River Golf Course and are listed as having an intended purpose of “recreation”.

GW106700 was installed in 2004. It was installed to a depth of 16 meters below ground surface and has a standing water level of 3 meters below ground surface. The water bearing zone is noted to be between 12.5 and 13 meters below ground surface. The license status is noted as “lapsed”.

GW047864 was installed in 1979. It was installed to a depth of 252 meters below ground surface and has a standing water level of 21 meters below ground surface. Several water bearing zones were recorded. The license status is noted as “cancelled”.

Five registered wells are located south of Milperra Rd near the corner of Ashford Ave. These wells are all noted as monitoring bores.

Well GW023146 is located in a residential property on Rickard Road, on the western side of the Georges River, approximately 200 meters from the Airport property boundary. This well was completed in 1965 and is listed as a private domestic water use well. The water bearing zone is noted as 4.2 meters below ground surface and the standing water level is noted as 3.6 meters below ground surface. It seems unlikely that this well, if still present, would be used for drinking water purposes. Furthermore, shallow groundwater from the Airport would likely discharge to the Georges River and may not impact on the well located on the opposite side of the river to the Airport.

Well GW108838 is located on the southern side of Bankstown Golf Club, approximately 800 meters south of the Airport property boundary. This well was installed in 2006 and is noted as a test bore. It was installed to 240 meters below ground surface. The license status is “cancelled”.

The locations of the registered wells are shown on **Figure 2** below.

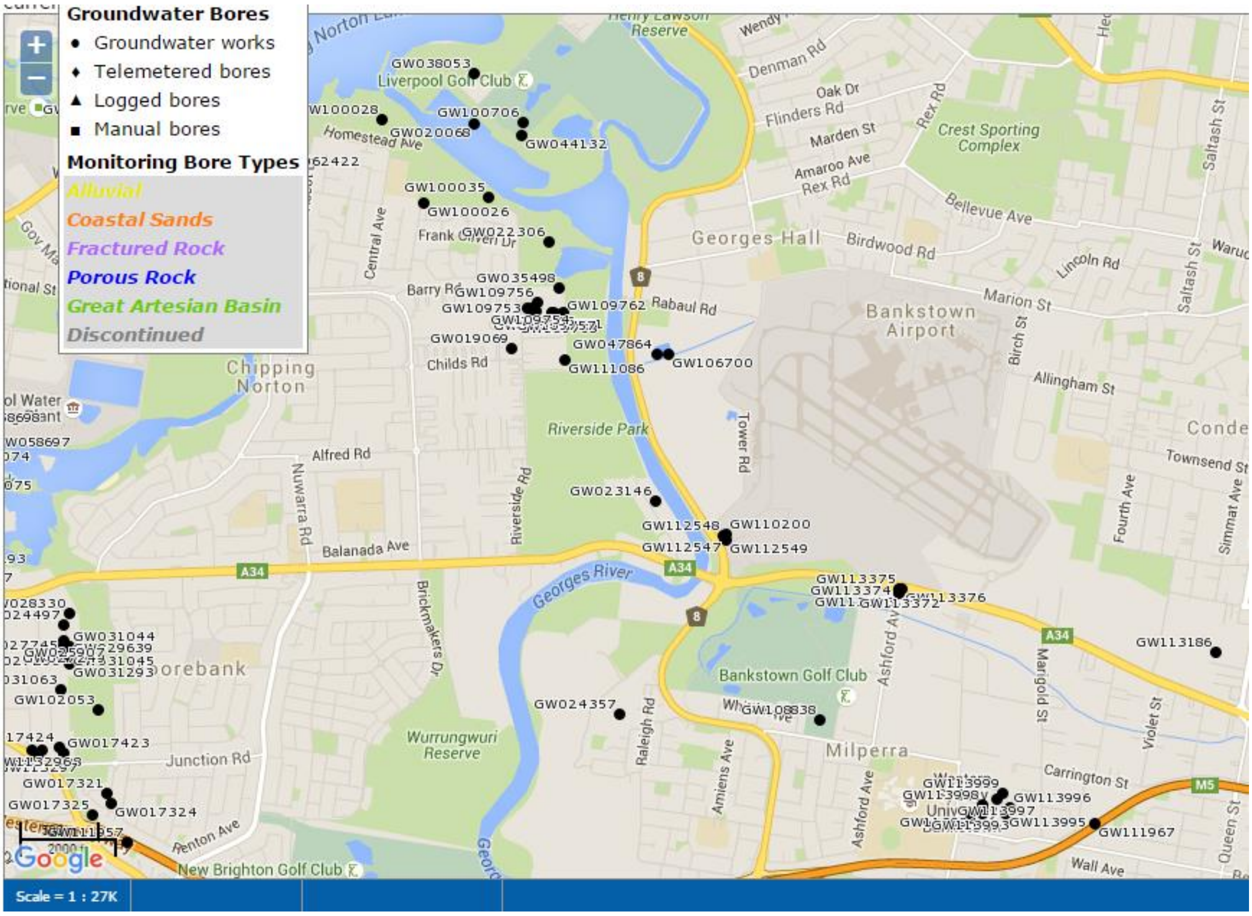


Figure 2 : Registered water bores around Bankstown Airport (Office of Water website search on 14 June, 2016)

4. Potential sources of PFAS at the Airport

This section provides a historical overview of operations at the airport, the results of our historical business listings search and the findings from our communications with the Department of Infrastructure and Regional Development (DIRD), Airservices Australia and NSW Fire & Rescue.

4.1 Historical overview

The site history has been based on a review of the report prepared by Godden Mackay Logan (April 2005) *Bankstown Airport, Heritage Management Strategy* as well as information in the *Bankstown Airport Master Plan and Environment Strategy 2014* (SMA, 2014). A brief outline of the site history is provided below.

- The Bankstown Airport site was formerly occupied by market gardens, poultry farms and commercial premises (including a service station) located at the corner of Milperra and Billiana Roads;
- Construction of the Bankstown Aerodrome commenced in 1940;
- The Royal Australian Air Force (RAAF) established at the site in late 1940. The activities undertaken by the RAAF included airfield and training operations, aircraft assembly and temporary accommodation for RAAF personnel;
- The Women’s Australian Auxiliary Air Force (WAAAF) established to the site in 1941. The activities undertaken by the WAAAF included training, administration and accommodation;
- The US Air Force was accommodated at the site from 1942 to 1945. The site was used as a base for a number of squadrons and accommodated the associated personnel;
- The Clyde Engineering Co Pty Ltd undertook maintenance, repair and modification of aircraft from 1942;
- Hawker de Havilland (subsequently Boeing) opened a factory in 1942 for the manufacture of aircraft and parts;
- A Mobile Naval Air Base was commissioned at Bankstown in 1945. As part of this commission, hangers, taxiways and associated facilities were constructed;
- From 1945 to 1950 sections of the site were used to house migrants;
- In 1952, a gravel runway was constructed in the 11/29 direction (914m).
- In 1962, a second 1,190 metre runway was constructed also in the 11/29 direction.
- The control of the Bankstown Airport was divested to the Department of Civil Aviation in 1980.
- Airport ownership was transferred to the Federal Airports Corporation in 1988.
- Ownership of the Airport was transferred to Sydney Airport Corporation Ltd (SACL) in 1998. Bankstown Airport Limited was then separated from SACL in 2001.
- BAL was sold to BaCH consortium in 2003.
- Boeing Aerostructures Australia relocated to Melbourne in 2013.

SMA has been the lease holder and operator of the Airport since December, 2003.

4.2 Historical business listings

Jacobs commissioned Lotsearch Pty Ltd (Lotsearch) to undertake a search of historical Universal Business Directories (UBD) from 1950, 1970 and 1991. Business listings from these directories have been scanned and geo-referenced and the Lotsearch report is provided in **Appendix B**. The search area included the Airport property and the area within 100 meters of the boundary.

The purpose of the historical business listing search was to identify businesses that may have stored or used materials containing PFAS through a review of the category the business was listed under and/or the business name. A large number of the listings indicated businesses involved in aircraft maintenance and repair and there is the possibility that these businesses may have stored or used aviation hydraulic fluids containing PFAS.

Two other (non-aviation) activities were identified as having the potential to use PFAS containing products. These are summarised in **Table 2** below.

Table 3 : List of non-aviation related activities with potential PFAS use identified through historical UBD listings

Dataset year	Business Activity	Organisation and Address	Comments
1991	Electroplaters	Goninans Platers Pty Ltd 7 Cooraban Rd, Milperra	Located just south of the Airport property. PFAS containing mist suppressants have been used in some electroplating industries. No further information on this business identified through internet search. Likely to be hydrogeologically downgradient of the Airport.
1970	Plastic coating specialist materials, Textile coaters and / or treaters	Coated Fabrics Pty Ltd Milperra Rd, Milperra	PFAS containing products have been used in treating textiles (eg. Scotchgard^{TM}) No further information on this business identified through internet search. Specific location on Milperra Rd unknown. Likely to be hydrogeologically downgradient of the Airport.

4.3 Information from the Department of Infrastructure and Regional Development

A letter was sent to the Department of Infrastructure and Regional Development (DIRD) requesting information on historical activities at the Airport that may have involved the use or storage of PFAS containing materials. A response from DIRD was received (letter to Bankstown Airport Limited dated 23 September, 2016). This response stated that the historical files reviewed by DIRD did not identify the use of PFCs or specific locations which may be of interest. Furthermore, no information on the use of fire fighting foam at Bankstown Airport was identified by DIRD.

4.4 Information from Airservices Australia

Jacobs contacted Airservices Australia (Airservices) to request information on the historic use and storage of AFFF at the Airport.

Airservices advised that Airservices was created in 1995 and has not carried out an Aviation Rescue and Fire Fighting (ARFF) service at Bankstown Airport. It is Airservices' understanding that the ARFF function at Bankstown Airport was last carried out by the Civil Aviation Authority (CAA), and that this ceased around 1991. Airservices stated that although it is likely that an AFFF was used prior to 1991, information with respect to the type of foam used by the CAA should be sourced through DIRD.

Information provided by Airservices to Jacobs in 2010 regarding historic storage or use of AFFF at the Airport identified two potential locations:

1) Old Fire Training Ground located in the area of the old sewer treatment works, adjacent to the control tower and adjacent to the eastern side of the golf course.
2) Fire Station located in the north eastern section of the airport. The area was characterized by a combination of tarmac hardstand, buildings and some areas of soft cover.

Figure 3 below is a photo of the former fire training ground provided by SMA. The approximate boundary of the area has been marked on the photo by SMA.


This area was used by the ARFF for training in fire fighting.

Figure 3 : Photo of the former fire training area (supplied by SMA)

In a submission to the Senate Inquiry into Contamination at Commonwealth, State and Territory sites in Australia where Fire Fighting Foams containing Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA) were used, Airservices stated that the CAA and Department of Civil Aviation used the AFFF product 3M Lightwater from the early 1980s. 3M Lightwater contained PFOS as an active ingredient and other PFAS such as perfluorooctanoic acid (PFOA). Airservices transitioned to another fire fighting foam called Ansulite in 2003. However this was later found to contain trace concentrations of PFOS and PFOA. In 2010, Airservices transitioned to a PFC free foam, Solberg RF6, at all airports where Airservices provides ARFF services with the exception of the joint civil military airports of Darwin and Townsville (Airservices, 2016).

Airservices (2016) also noted that the ARFF at Bankstown was operated between 1950 and 1991 and 3M Lightwater was used.

4.5 Information from NSW Fire & Rescue

NSW Fire & Rescue was requested to provide information on fire incidents at the Airport, whether AFFF was used during these incidents and the approximate amount of AFFF applied.

In NSW Fire & Rescue's response, it was noted that computerised records of incidents are available from 1987 and AFFF was phased out by NSW Fire & Rescue in 2007. During the period 1987 – 2007, NSW Fire & Rescue responded to three incidents at Bankstown Airport where AFFF was used to extinguish the fire.

1) 7/10/2002 – Aircraft fire on the runway – low expansion alcohol resistant (ATC) foam was used. Information from SMA indicated that this incident occurred on runway 29R. However more details on the location on the runway were not available.

2) 9/11/2002 – Special structure fire in a shelter (no further details on location available) – low expansion AFFF foam was used. Information from SMA indicated that this was a fire in early hours of the morning at the Qantas test cell area. SMA advised that this is where the Bunnings building is now situated.
3) 11/11/2003 – Aircraft fire on runway – low expansion AFFF foam was used. SMA advised that this incident occurred in an area known as the “southern triangle”, north of the aviation museum which has since been developed.

The approximate locations of the incidents on 9/11/2002 and 11/11/2003 are shown on **Figure A1** in **Appendix A**.

4.6 Information from SMA incident records

SMA reviewed the internal incident records as well as relevant Australian Transport Safety Bureau Reports. The following incidents were identified in addition to those presented in Section 4.5 above:

1) 11/9/2005 – Aircraft crash near the former fire training area. Photos reviewed by SMA indicate that AFFF was applied.
2) 2006 – Aircraft crash near Link Rd. No further information on the use of AFFF was available.
3) 2011 – Helicopter fire near the TOLL facility. No further information on the use of AFFF was available.

The approximate locations of the incidents are shown on **Figure A1** in **Appendix A**.

4.7 Information from previous investigations

Jacobs reviewed the Contaminated Sites Register and associated reports for the Airport maintained by SMA. The purpose of this review was to identify potential PFAS sources at the Airport and soil, surface water or groundwater investigations where analysis of PFAS has been performed. The potential PFAS sources are summarised below. Previous soil, surface water or groundwater investigations which have included analysis of PFAS are discussed further in Section 5.

An Environmental Site Assessment for the Airport was undertaken in 2000 (URS, 2000). This assessment involved a review of existing documentation, a site reconnaissance and interviews with Airport personnel. Jacobs identified the following potential PFAS sources based on our review of the environmental assessment:

1) The environmental assessment notes that a fire fighting training area was located in the vicinity of the former sewerage treatment plant on the western side of the Airport Property (near Tower Rd). Practices were to set materials alight using fuels such as diesel and white spirits and then put out the fire using foam based fire retardants. Fires were lit once a week during operation of the facility from the 1950s until fire services left the site (noted by Jacobs to be around 1991 based on information provided by Airservices).
2) The aircraft component manufacturing activity operated by Hawker de Havilland (and subsequently Boeing) included an alodining line involving various metal treatments such as chromic conversion coating and chromic acid anodising. Jacobs notes that PFAS may have been present in mist suppressants, if any such suppressants were used in these processes.
3) Pacific Turbine (sub-tenant to Hawker de Havilland) operated an electroplating activity, constructed in 1978. The plating area was located on metal framework over a concrete pit approximately 2 meters deep. Chemicals for the plating activity were stored outside in bunded lockable dangerous goods storage cabinets. Jacobs notes that mist suppressants used, if any, may have contained PFAS.
4) The environmental assessment noted that approximately ten 200 Litre drums of hydraulic oil (two different types of aviation hydraulic oil) were stored in the hydraulic oil storage and pumping station in Building 63. Jacobs notes that aviation hydraulic fluid can contain PFAS.
5) Several historical waste landfilling activities were identified in the environmental assessment. These included:

a) anecdotal reports of dumped chemicals from the Department of Civil Aviation or Department of Transport facilities at Waverton during the 1960s and early 1970s in the western area of the Airport (Jacobs notes this is now referred to as Landfill 2);

b) use of rubbish and building waste from the Airport as fill under the Runway 11 approaches and to a lesser extent under the eastern Runway 29 approaches until 1988;

c) dumping of sanitary waste cans (night soil) in the eastern side of the Airport (Jacobs notes this is now referred to as Landfill 1); and,

d) the use of building materials as fill at the former Sewerage Treatment Plant on Tower Rd.

The waste material in these historical landfilling areas may have contained PFAS.

During investigations of the areas known as Site 1 and Site 2 on Link Road in the north of the Airport property in 2016, SMA personnel advised Jacobs that a fire training exercise had been conducted on part of the area. The exercise consisted of lighting a drum on fire and having emergency services put it out with a mixture of water and foam (Jacobs, August 2016a and b). These investigations are discussed further in Sections 5.3 and 5.4.

During an investigation for the Aeromedical Facility in the north east of the Airport, Jacobs was advised that a fire training exercise involving the use of AFFF had occurred approximately 140m north east (hydrogeologically upgradient) of the investigation area in 2006 – 2007 (Jacobs, October 2016). This investigation is discussed further in Section 5.6.

4.8 Current activities

Turbomeca Australasia Pty Ltd (Turbomeca) operates a helicopter engine maintenance facility on leased property at the Airport. The facility opened in 2010. The facility has a fire suppression system which includes use of AFFF. The AFFF product used is Polarfilm AR-AFFFC6 Premium 3/3 supplied by Orion Safety Industries Ltd. The Material Safety Data Sheet (MSDS) for the product indicates that the product does not contain PFOS, PFOA or their precursors. However the product does contain C6 fluorinated surfactants.

Jacobs visited the Turbomeca facility on 31 October, 2016. During the visit, Jacobs observed that the AFFF system is used for fire suppression in engine test bays enclosed within a building. Turbomeca advised that if the AFFF system was to be used, the foam and water would drain into floor drains which are connected to an underground concrete tank in a closed system. The tank can then be pumped out for appropriate off-site disposal. Turbomeca conducts periodic integrity inspections of the drainage system and the tank.

The AFFF product is stored in a stainless steel tank with approximately 200 Litre capacity. The tank is fitted to the outside of the building housing the engine test cell. There is a concrete slab under the tank and a 300 mm clearance between the base of the tank and the slab. There is no secondary containment installed for the tank. A photo of the storage tank is provided as **Figure 4** below.

Turbomeca advised that no fires have occurred in the engine test bay and the AFFF has never been used.

Figure 4 : Photo of the AFFF storage tank at the Turbomeca facility

An aeromedical facility operated by TOLL will soon commence operations at the Airport. Solberg RF6 is proposed to be used in fire suppression systems at the facility. As noted in Section 4.4, Solberg RF6 is the AFFF product that Airservices transitioned to in 2010. Airservices Australia has stated that this foam is PFC free (Airservices Australia, 2016) and the product brochure states that the product is fluorosurfactant and fluoropolymer free (Solberg, 2014). Therefore the storage of this product for the facility has been discarded as a potential PFAS source in this assessment.

There are a large number of aviation related activities undertaken by tenants at the Airport where aviation hydraulic fluid may be used and / or stored. Hydraulic fluid may also leak from aircraft in parking areas. As noted in Section 2, small amounts of PFAS (<0.1%) can be present in aviation hydraulic fluids.

4.9 Summary of potential PFAS sources at the Airport

The potential PFAS sources at the Airport identified for this study are summarised in Table 4 below along with a subjective indication of the significance of each source. Where known, the approximate locations of the potential PFAS sources are shown on **Figure 1** in **Appendix A**.

Table 4 : Summary of potential PFAS sources at the Airport

No.	Potential PFAS Source	Significance	Comments
1	Historic use and storage of AFFF in the former fire training area.	High	Regarded as “high” significance as the use of AFFF containing PFAS is confirmed. The AFFF also appears to have been used approximately once per week for up to 40 years. Details of whether the ground was surfaced and whether drainage was present (i.e. site controls) have not been obtained/provided. However it appears likely that a significant amount of AFFF would have entered the ground.
2	Historic use of AFFF for fire training in the area on Link Road.	Moderate	Information provided by SMA indicated that the AFFF was used on one occasion in this area only. This appears to have been in a similar area as the incident in 2006 (potential source area 9 below). An investigation in this area was conducted in 2016 and PFAS compounds were detected in soil and groundwater (discussed further in Section 5.3).
3	Historic use of AFFF for fire training in the north east of the Airport, near Schofields Flying Club	Moderate	Information provided by SMA indicated that a fire training exercise involving the use of AFFF had occurred in this area in 2006 – 2007. Jacobs has assumed this was a one-off exercise (discussed further in Section 5.5).
4	Historic use and storage of AFFF in the former fire station area.	Moderate	It is not clear from the information available if AFFF was used or stored in this area. However if it was used, then the AFFF would have contained PFAS and would have entered the ground.
5	Fire incident on runway 29R on 7/10/2002	Moderate	Location on runway 29R not confirmed. The use of AFFF is confirmed. However this was a one-off incident.
6	Fire incident in former Qantas test cell on 9/11/2002	Moderate	This location is at the current Bunnings Warehouse site. Regarded as “moderate” as the use of AFFF is confirmed. However this was a one-off incident. Earthworks for the development of the Bunnings site may have reduced soil contamination (if any).
7	Fire incident on runway in Southern Triangle on 11/11/2003	Moderate	The use of AFFF is confirmed. However this was a one-off incident.

No.	**Potential PFAS Source**	**Significance**	**Comments**
8	Fire incident near former fire training area in 2005	Moderate	The use of AFFF is confirmed. However this was a one-off incident.
9	Fire incident near Link Rd in 2006	Moderate	No information on the use of AFFF was obtained. However Jacobs has assumed AFFF was applied. This appears to have been in the same area as potential source no. 2 and as noted above, PFOS was detected in soil and groundwater in this area.
10	Helicopter fire near TOLL facility in 2011	Moderate	No information on the use of AFFF was obtained. However Jacobs has assumed AFFF was applied.
11	Historic and current storage of AFFF at the Turbomeca facility.	Low	The AFFF is currently stored in an above ground tank and has not been used. The product does not contain PFOS, PFOA or their precursors. However the product does contain C6 fluorinated surfactants.
12	Landfill areas 1 and 2	Moderate	There is only limited information about the nature of waste deposited in the landfills.
13	Historic use of mist suppressants at the Hawker de Havilland and Pacific Turbine facility	Low	The use of mist suppressants has not been confirmed. If these were used then the product may not have contained PFAS. Furthermore, unlike AFFF, which was applied in large volumes over ground surfaces during fire fighting and fire fighting training exercises, the mist suppressants would normally have only entered the ground due to leaks or spills.
14	Aviation hydraulic fluid	Low	Aviation hydraulic fluids would normally have only entered the ground from leaks or spills. The PFAS content in these fluids is also understood to be <0.1%. However there is the possibility that low level impacts, if any, would be wide spread due to leaks from aircraft parked on the grass areas of the Airport.

5. Previous PFAS investigations

A review of previous investigations and monitoring reports was undertaken to identify studies where PFAS was included in the laboratory analysis. The findings of this review are summarised below. Locations where PFAS sampling was conducted are presented in **Appendix A, Figure A1**.

5.1 Detailed Contamination Assessment, Proposed NETS Facility, 501 Tower Road Bankstown Airport (JBS&G, April, 2016)

This investigation was undertaken as part of the planning approval process for the Newborn and paediatric Emergency Transport Service (NETS) facility. The site has an area of approximately 3,000 m^2.

Soil sampling was conducted at nine locations and groundwater sampling was conducted from three wells at the site. A total of 13 soil samples and 3 groundwater samples were analysed for an extended PFAS suite. PFOS was reported at concentrations above the laboratory limit of reporting (LOR) in two samples with a maximum concentration of 0.018 mg/kg. The concentration of PFHxS exceeded the LOR in one soil sample with a reported concentration of 0.006 mg/kg.

PFOS concentrations in the three groundwater samples were all below the LOR. However concentrations of Perfluorobutanesulfonic acid (PFBS) (maximum concentration 0.00006 mg/L), PFHxS (maximum concentration 0.00017 mg/L) and Perfluorohexanoic acid (PFHxA) (maximum concentration 0.00006 mg/L) were reported above the LOR.

5.2 Contamination Investigation, National Parks and Wildlife Service Site Tower Road, Bankstown Airport (Jacobs, July 2016)

This investigation involved soil sampling at nine locations in or close to the construction footprint for the upgrade to the National Parks and Wildlife Services Site on Tower Rd. Three of the soil samples were analysed for PFOS, PFOA and 6:2 FTS. All of the samples were collected from the ground surface (i.e. above the groundwater bearing zone). Concentrations of the target PFAS compounds were below the laboratory limit of reporting in all three samples.

5.3 Contamination Investigation, Site 1 (Link Road), Bankstown Airport (Jacobs, August 2016a)

This investigation was undertaken in an area of approximately 20,000 m^2 that was proposed for development. As noted in Section 4.6, SMA advised Jacobs at the time of the investigation that a fire training exercise using AFFF had been carried out in the south east portion of the area.

A total of 15 soil samples and three groundwater samples were submitted for analysis of PFOS, PFOA and 6:2 FTS. The soil samples were all collected from the ground surface. Concentrations of the target PFAS compounds were above the laboratory reporting limits in 13 of the soil samples. The maximum concentration reported was 5.7 mg/kg of PFOS. While the maximum PFOS concentration in soil exceeded the adopted ecological screening value of 4.71 mg/kg, it was well below the adopted human health based investigation level of 90 mg/kg.

PFOS was the only PFAS compound detected in the groundwater samples at concentrations above the laboratory reporting limits. Concentrations of PFOS above the reporting limits were detected in two of the three wells sampled. The maximum concentration of PFOS reported was 0.02 µg/L which was below the adopted risk screening level of 0.2 µg/L.

5.4 Contamination Investigation, Site 2 (Drover Road), Bankstown Airport (Jacobs, August, 2016b)

This investigation covered an area of approximately 35,000 m^2 that was also proposed for development. The area was located adjacent to Site 1 and to the west of Drover Road. The north west portion of this area was also part of the area used for the fire training exercise referred to in Section 5.3.

A total of 21 soil samples and three groundwater samples were submitted for analysis of PFOS, PFOA and 6:2 FTS. The soil samples were all collected from the ground surface. Concentrations of the target PFAS compounds were above the laboratory reporting limits in nine of the soil samples. The maximum concentration reported was 0.34 mg/kg of PFOS which was below the adopted ecological screening value of 4.71 mg/kg as well as the adopted human health based investigation level of 90 mg/kg.

PFOS was the only PFAS compound detected in the groundwater samples at concentrations above the laboratory reporting limits. Concentrations of PFOS above the reporting limits were detected in two of the three wells sampled. The maximum concentration of PFOS reported was 0.04 µg/L which was below the adopted risk screening level of 0.2 µg/L.

5.5 Contamination Investigation, Site 3 (Avro Street), Bankstown Airport (Jacobs, August 2016c)

The area referred to as Site 3 was a development site of approximately 20,000 m^2 near Avro Street in the north of the Airport. A total of 15 soil samples and three groundwater samples were submitted for analysis of PFOS, PFOA and 6:2 FTS. The soil samples were all collected from the ground surface. Concentrations of the target PFAS compounds were above the laboratory reporting limits in eight of the soil samples. The maximum concentration reported was 0.062 mg/kg of PFOS which was below the adopted ecological screening value of 4.71 mg/kg as well as the adopted human health based investigation level of 90 mg/kg.

PFOS was the only PFAS compound detected in the groundwater samples at concentrations above the laboratory reporting limits. Concentrations of PFOS above the reporting limits were detected in all three wells sampled. The maximum concentration of PFOS reported was 0.05 µg/L which was below the adopted risk screening level of 0.2 µg/L.

5.6 Additional Contamination Investigation, Proposed NSW Ambulance Facility, Bankstown Airport (Jacobs, October 2016)

This investigation was conducted prior to the development of the NSW Ambulance Facility on a 30,000 m^2 area of land located in the east of the Airport. The investigation report noted that information provided by SMA indicated a fire training exercise involving the use of AFFF had occurred approximately 140m north east (hydrogeologically upgradient) of the investigation area in 2006 – 2007.

Two groundwater samples from wells estimated to be downgradient of the suspected fire training area were analysed using a PFAS suite consisting of 20 PFAS compounds including PFOS and PFOA. Concentrations of all analytes were below the laboratory reporting limits.

5.7 Biannual stormwater monitoring

A biannual stormwater monitoring program is in place at the Airport as part of the Airport's Water Quality Management Plan (BAL, 2012). Surface water samples are collected from eight locations representing each of the seven sub-catchments within the Airport property. The sampling locations and stormwater catchment areas are presented in **Figure 5 below**.

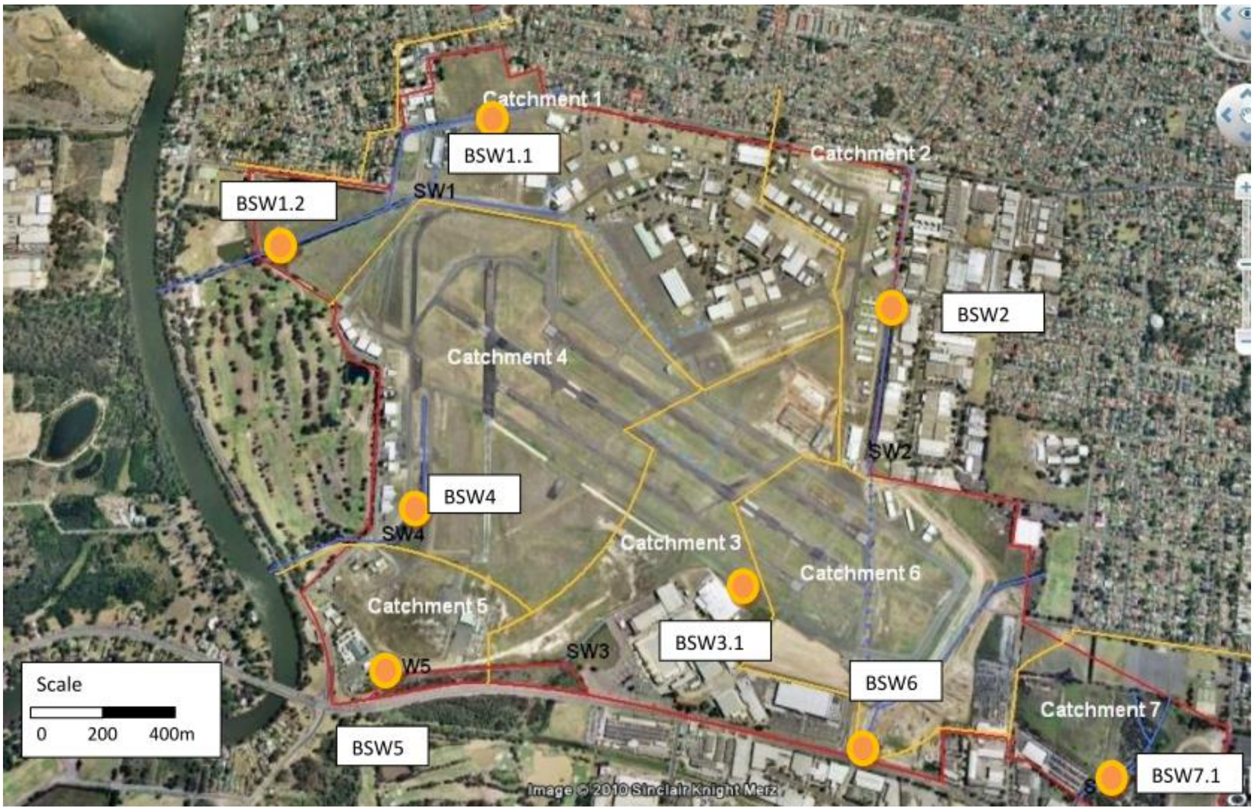
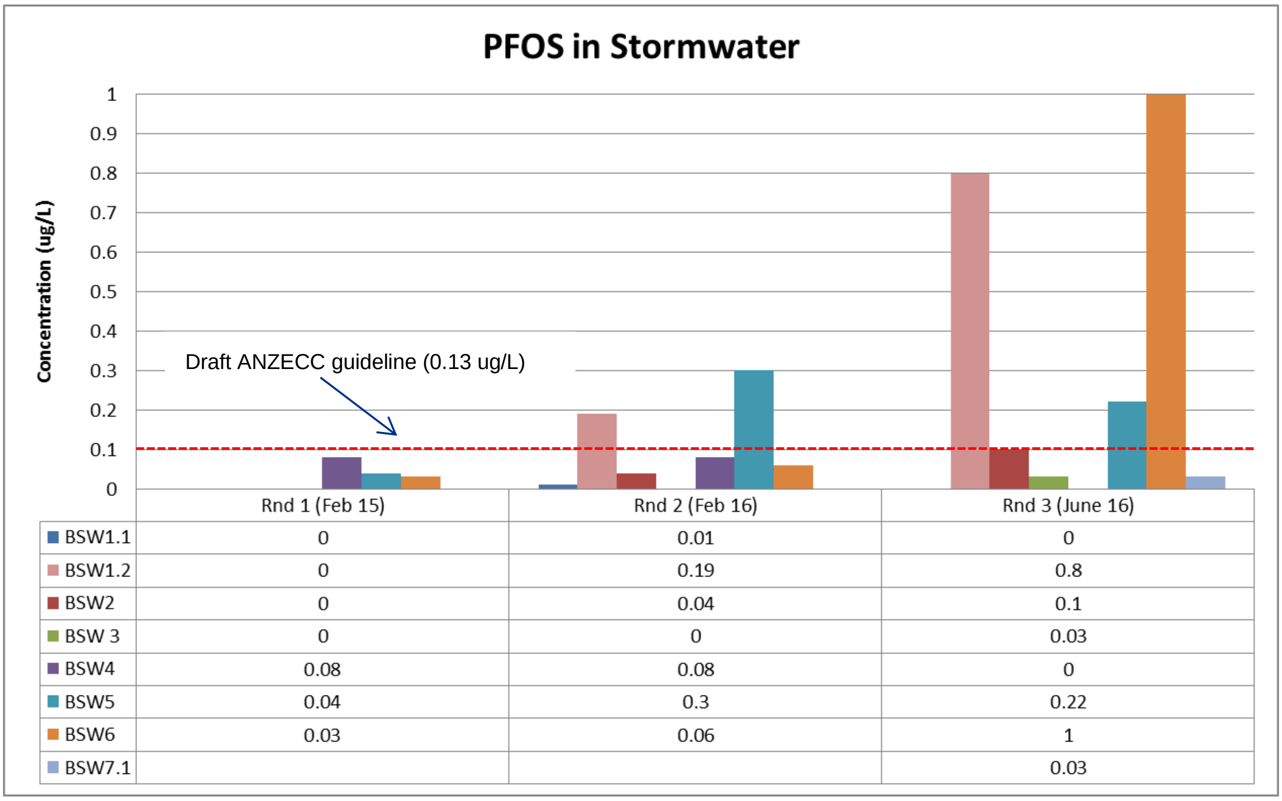


Figure 5 : Bankstown Airport surface water catchments and monitoring locations (source: SMA)

Surface water samples collected in February, 2015 (SMA, 2015) and June, 2016 (Jacobs, June 2016) were analysed for PFOS, PFOA, 6:2 FTS and 8:2 FTS. PFAS was not included in the laboratory analysis suite for the August, 2015 sampling round.

PFOS results are summarised in **Figure 6** below. PFOA was detected in one sample only (0.04 µg/L at BSW1.2 in February, 2016). 6:2 FTS and 8:2 FTS were not detected in any samples.



	Rnd 1 (Feb 15)	Rnd 2 (Feb 16)	Rnd 3 (June 16)
BSW1.1	0	0.01	0
BSW1.2	0	0.19	0.8
BSW2	0	0.04	0.1
BSW 3	0	0	0.03
BSW4	0.08	0.08	0
BSW5	0.04	0.3	0.22
BSW6	0.03	0.06	1
BSW7.1			0.03

Figure 6 : Summary of PFOS concentrations in stormwater samples

The maximum concentration of PFOS in surface water reported to date was 1 µg/L in the sample collected from location BSW6 in June, 2016. This location is downstream of stormwater Catchment 6 which collects water from the south eastern part of the Airport including the south eastern ends of the runways. The second highest result was 0.8 µg/L in the sample collected from BSW1.2. This location is downstream of Catchment 1 in the north of the Airport.

Locations BSW1.1 and BSW2 are upgradient locations, established to assess the quality of stormwater entering the Airport stormwater network from upgradient catchment areas. As noted in Figure 6, concentrations of PFOS have been detected in both locations, indicating a source or sources of PFAS upgradient of the Airport.

It is noted that surface water samples are normally collected immediately following a rain event. However the sampling for June, 2016 was conducted in dry conditions with limited water flow. This may have influenced the reported PFOS concentrations for the June, 2016 monitoring event.

In relation to preliminary risk screening values for protection of aquatic ecology, Jacobs has assumed that the values for slightly to moderately disturbed ecosystems (95% species protection) would apply. The reported concentrations of PFOS were all below the Airservices Australia guidance value of 6.66 µg/L. However there have been several exceedances of the Draft ANZECC guideline value of 0.13 µg/L.

The maximum reported concentration of PFOS was well below the enHealth recreational water quality guideline value for PFOS + PFHxS of 5 µg/L. The maximum reported PFOS value in surface water was higher than the Airservices Australia guideline value in surface water for consumption of fish (0.65 ng/L). It is noted that current laboratory PFOS reporting limits are well above this criterion.

The surface water guideline values apply in the receiving water after dilution. Sampling of the Georges River would be required to further assess PFOS concentrations against the guidelines.

5.8 Annual groundwater monitoring

Groundwater monitoring is undertaken annually at the Airport in accordance with a Water Quality Management Plan (BAL, 2012). The monitoring program focusses on three distinct areas of environmental concern within the Airport – Landfill 1 (2 groundwater monitoring wells), Landfill 2 (3 groundwater monitoring wells) and the former Boeing facility (referred to as Site 533) (16 monitoring wells). The monitoring program does not currently aim to collect data on broader groundwater quality across the Airport property.

The groundwater monitoring round carried out in June, 2016 included analysis of PFOS, PFOA and 6:2 FTS in selected samples (Jacobs, August 2016d). The results are summarised as follows:

- One sample was analysed from Landfill 1. The reported PFOS concentration was 0.14 µg/L. PFOA and 6:2 FTS concentrations were below the laboratory reporting limits.
- Three samples were analysed from Landfill 2. PFOS concentrations were above the laboratory reporting limit in all three samples with a maximum concentration of 0.17 µg/L. PFOA concentrations were also above the laboratory reporting limit in all three samples with a maximum concentration of 0.09 µg/L. Concentrations of 6:2 FTS were below the laboratory reporting limit in all three samples.
- Five samples from Site 533 were analysed and all of the target PFAS concentrations were below the laboratory limits of reporting.

All PFOS, PFOA and 6:2 FTS concentrations reported for the June, 2016 groundwater monitoring round were below the enHealth interim screening criteria. It is noted that these criteria are set for the summation of PFOS and PFHxS concentrations and PFHxS was not included in the groundwater sample analysis. Despite this, it is considered unlikely that the addition of PFHxS would have resulted in the criteria being exceeded.

5.9 NSW EPA Decision Tree

It is noted that the NSW EPA Decision Tree trigger points have been set for total PFAS. The majority of the testing undertaken at the Airport site to date has used a basic suite of PFAS compounds and PFOS has been the main PFAS contaminant identified.

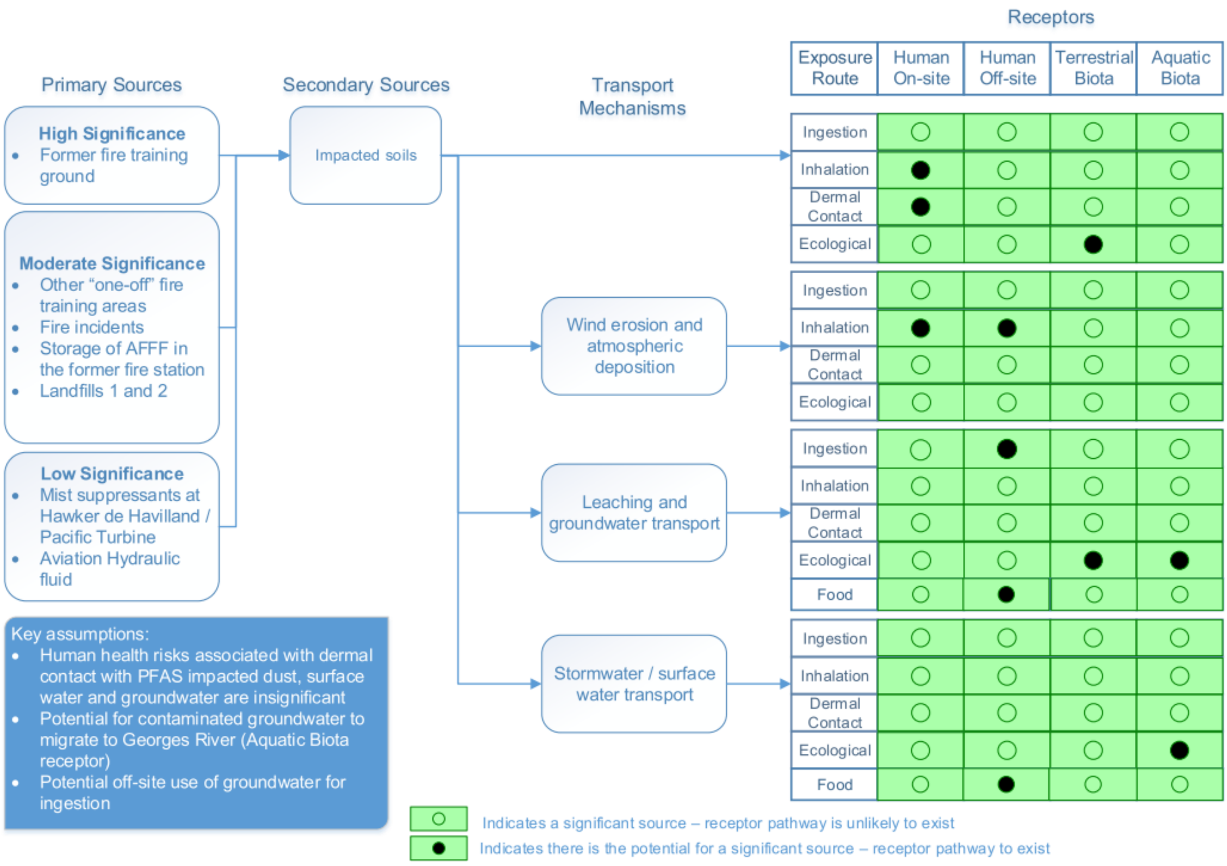
Based on a maximum reported concentration of PFOS in on-site surface water samples of 0.1 µg/L and in on-site groundwater samples of 0.17 µg/L, the Airport would be classified as a Priority 2 site under the NSW EPA Decision Tree.

However it is noted that the groundwater sampling conducted to date has not targeted PFAS source areas such as the former fire training ground. Furthermore, no soil leachate testing for FPAS has been undertaken.

6. Preliminary conceptual site model

A preliminary conceptual site model for the risks associated with PFAS contamination at the Airport has been developed. The purpose of a conceptual site model is to identify known or potential sources of contamination, human health and environmental receptors including exposure mechanisms and pathways between the sources and receptors. A risk is present where there is a complete source – pathway – receptor linkage. The conceptual site model can also be useful in identifying data gaps for further investigation.

The identified potential sources, transport mechanisms, receptors and associated exposure mechanisms are summarised in **Figure 6** below.



Exposure Route	Human On-site	Human Off-site	Terrestrial Biota	Aquatic Biota
Ingestion	○	○	○	○
Inhalation	●	○	○	○
Dermal Contact	●	○	○	○
Ecological	○	○	●	○
Ingestion	○	○	○	○
Inhalation	●	●	○	○
Dermal Contact	○	○	○	○
Ecological	○	○	○	○
Ingestion	○	●	○	○
Inhalation	○	○	○	○
Dermal Contact	○	○	○	○
Ecological	○	○	●	●
Food	○	●	○	○
Ingestion	○	○	○	○
Inhalation	○	○	○	○
Dermal Contact	○	○	○	○
Ecological	○	○	○	●
Food	○	●	○	○

Key assumptions:

- Human health risks associated with dermal contact with PFAS impacted dust, surface water and groundwater are insignificant
- Potential for contaminated groundwater to migrate to Georges River (Aquatic Biota receptor)
- Potential off-site use of groundwater for ingestion

○ Indicates a significant source – receptor pathway is unlikely to exist

● Indicates there is the potential for a significant source – receptor pathway to exist

Figure 7 : Preliminary conceptual site model for PFAS contamination at Bankstown Airport

Further investigations on the extent of PFAS contamination sources, if any, the potential for wind erosion, surface water and groundwater transport and a review of toxicological information would be required to further refine the model.

As noted in Section 3.5.1, a registered water well for domestic use was identified during a review of the Office of Water groundwater database. The well was noted to have been installed in 1965 and was located in a residential property on Rickard Road, on the western side of the Georges River, approximately 200 meters from the Airport property boundary. While it seems unlikely that groundwater would be used for domestic consumption in the area and it is unlikely that shallow groundwater from the Airport influences the area on the western side of the Georges River, this pathway is currently noted as potentially significant until further data is obtained.

Human consumption of food is a potential pathway if the Georges River is impacted with PFAS and fish from the river is consumed. As noted in Section 3.3, the Department of Primary Industries advise against eating fish or shell fish from the Georges River upstream of the Rabaul Rd boat ramp. However, surface water and groundwater discharge from the Airport would occur downstream of this point.

7. Conclusions and recommendations

PFAS are emerging contaminants and their sources, fate and transport and toxicity is still not well understood. Similarly, the regulatory framework for the characterisation, assessment and management of risks associated with PFAS is evolving.

A number of potential PFAS sources have been identified at the Airport. The most significant potential source is associated with the historic use of AFFF containing PFAS at the former fire training ground. However AFFF was also used for fire fighting during incidents and for fire training at other locations around the Airport. It is understood that 3M Lightwater was the main AFFF product used at the airport and PFOS is the primary PFAS of concern in this product.

Other potential sources of PFAS contamination at the Airport include the storage of AFFF for emergency at the Turbomeca facility, aviation hydraulic fluid across the Airport, the potential historical use of mist suppressants in plating and other metal processing activities in the former Boeing area and the waste landfills at the Airport. It is noted that no information confirming the use of hydraulic fluids or mist suppressants which contained PFAS has been obtained. Furthermore, unlike the use of AFFF which was applied in large volumes directly to ground surfaces, sub-surface impacts from hydraulic fluid and mist suppressants would only have occurred through spills or leaks. Groundwater monitoring around the landfills at the Airport has not detected any significant emissions of PFAS from the landfills to groundwater. Therefore these sources are considered to present a less significant risk than the historic AFFF use in the former fire training area.

A number of soil, surface water and groundwater investigations and monitoring programs have been undertaken at the Airport and these have recently included analysis of PFAS. The programs have not specifically targeted PFAS source areas. However minor concentrations of PFOS and to a lesser extent PFOA and 6:2 FTS have been reported.

There is no known beneficial use of groundwater at the Airport or immediately hydraulically down gradient. However further data is needed to confirm that the registered well at the residential property on Rickard Rd is not used for drinking water purposes and / or is not influenced by shallow groundwater from the Airport. The most significant exposure pathways are more likely to be human direct contact with PFAS impacted soil at the Airport and exposure to ecological receptors in the Georges River via surface water and groundwater migration from the Airport. While the region of the Georges River where surface water and groundwater from the Airport would discharge is likely to be impacted by other urban contaminants, the advice from Department of Primary Industries against eating fish or shell fish from the Georges River applies upstream of the discharge area. Therefore the potential for people to consume fish impacted by PFAS migration (if present) from the Airport may need to be further assessed.

None of the investigation or monitoring data reviewed as part of this preliminary risk assessment indicates an immediate risk of harm to human health or the environment. Based on the maximum concentrations of PFOS in on-site surface water and on-site groundwater at the Airport, the site would be classified as Priority 2 under the NSW EPA Decision Tree. The NSW EPA Decision Tree states that Priority 2 sites are to be further investigated once investigations at Priority 1 sites are completed.

In order to further assess and manage the risks identified in this preliminary assessment, the following recommendations are made:

1) **Investigation of the former fire training area**. A soil and groundwater investigation of the former fire training area is recommended in order to assess the magnitude and extent of PFAS impacts, if any.
2) **Changes to the current water quality monitoring program.** A separate review of the current groundwater monitoring program for the Airport recommended expansion of the current groundwater monitoring network to assess up-gradient and down-gradient groundwater quality. One of the proposed groundwater monitoring well locations was downgradient of the former Sewerage Treatment Plant which is also the location of the former fire training ground. Changes to the current surface water monitoring locations were also recommended including the addition of monitoring in the Georges River. These recommendations are considered relevant based on this preliminary PFAS risk assessment. However it is

further recommended that the analysis suites for PFAS are broadened. Analysis costs have fallen over the past 12 months and most labs offer a more comprehensive suite of PFAS compounds that has previously been used for the Airport. As a minimum, perfluorohexane sulfonic acid (PFHxS) should be included in all future PFAS analysis in order to be able to assess concentrations against the enHealth interim criteria.

3) **Current storage of AFFF (C6 chain) for emergency use at the Turbomeca facility**. The AFFF system at the Turbomeca is used in an enclosed helicopter engine test bay with a closed drainage system. If the AFFF was to be used, the foam and water would drain to a holding tank that could be pumped out for appropriate disposal off-site. The drainage system and holding tank is periodically inspected by Turbomeca to ensure it’s integrity. The AFFF is stored in an above ground stainless steel tank with clearance between the base of the tank and the concrete floor slab. Any leaks from the tank would therefore likely be detected. No changes to the current system are recommended. However, when the current AFFF product is due for replacement, it is recommended that SMA ensure a review is undertaken and where feasible, the foam should be replaced with a fluorine free foam. Further guidance on environmental issues regarding the ongoing use of AFFF can be obtained from the Queensland Government’s Environmental Management of Firefighting Foam Policy (QLD DEHP, 2016).

4) **Aviation hydraulic fluid.** A review of the aviation hydraulic fluid products historically and currently used at the Airport is recommended. The review should aim to determine if the products used contained PFAS, the main PFAS compounds and approximate percentage content. Should this review identify that PFAS containing products have been used then the significance of this source in the conceptual site model may need to be revised.

5) **GEMS 002 PFC – management actions advice**. For the purposes of GEMS 002, this Preliminary PFAS Risk Assessment could be used as a Trigger Assessment for new activities at the Airport. For activities that will be located in or in the vicinity of the identified potential PFAS source areas, Preliminary and Detailed Site Investigations in accordance with Schedule A of the NEPM should be undertaken. For activities located outside these areas, the risk of significant PFAS contamination to be present is considered low and further investigation is not considered necessary. However, should a detailed site investigation be undertaken for other reasons (ie. potential presence of non-PFAS contaminants) then it is recommended that PFAS compounds are included in the laboratory analysis suites. Additional data on PFAS concentrations in soil, groundwater or surface water at the Airport should be compiled to support updates to the Conceptual Site Model and revisions of the risk assessment in the future.

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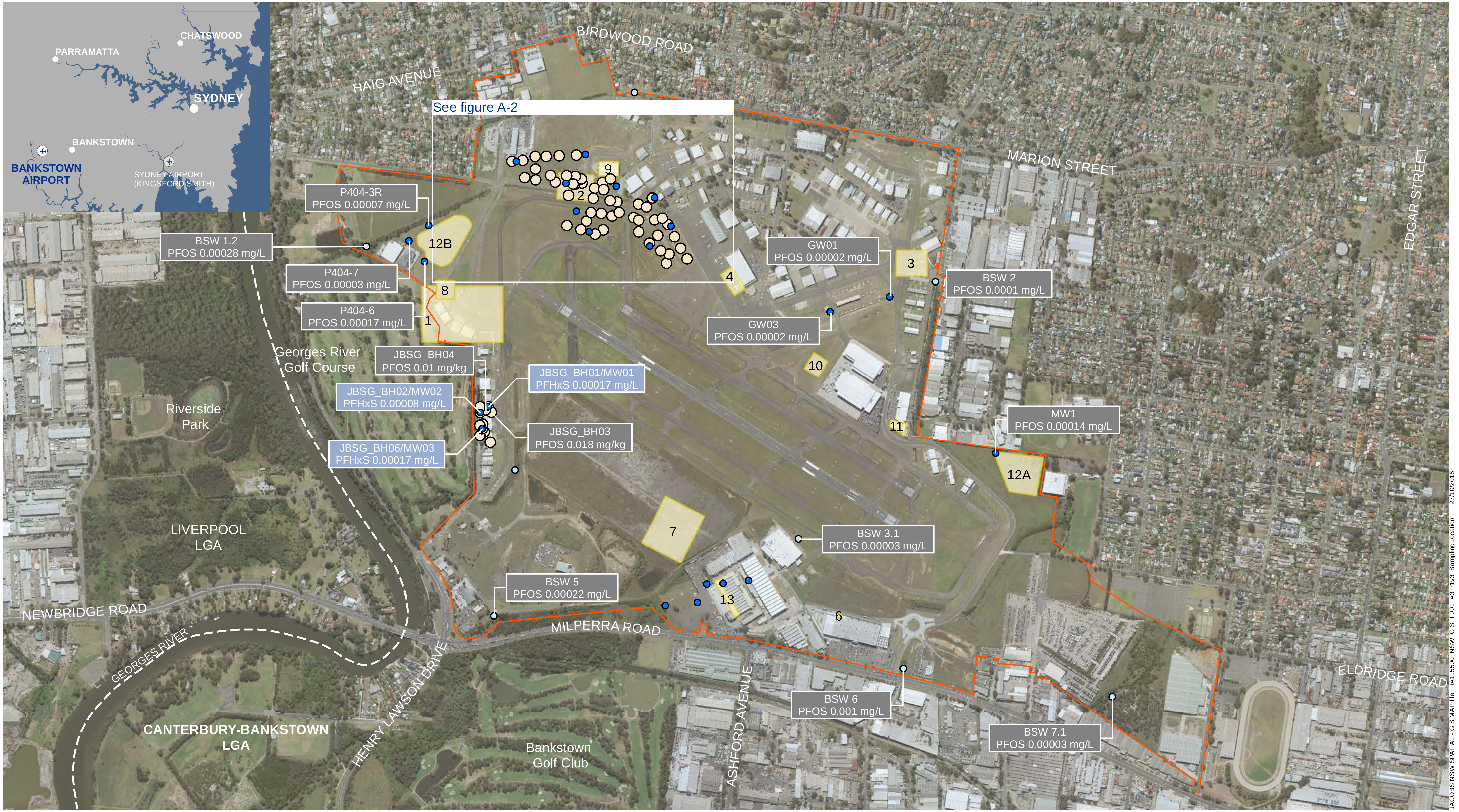
Appendix A. Additional Figures



JACOBS NSW SPATIAL - GIS MAP file : IA115500_NSW_GIS_F001_A3_r1v3_SamplingLocation | 27/10/2016

🟥	Bankstown airport
PFOS sampling location	
●	Groundwater sampling
○	Surface water sampling
○	Soil sampling
Site ID PFOS mg/L	PFOS detected (label)
Site ID PFHxS mg/L	PFHxS detected (label)
🟨	Potential PFAS sources:

1 Use and storage of AFFF in the former fire training area.
2 Use of AFFF for fire training in the area on Link Road.
3 Use of AFFF for fire training in the north east of the Airport, near Schofields Flying Club
4 Use and storage of AFFF in the former fire station area
5 Fire incident on runway 29R on 7/10/2002 (location not identified)
6 Fire incident in former Qantas test cell on 9/11/2002
7 Fire incident on runway in Southern Triangle on 11/11/2003
8 Fire incident near former fire training area in 2005
9 Fire incident near Link Rd in 2006
10 Helicopter fire near TOLL facility in 2011
11 Storage of AFFF at the Turbomeca facility
12 Landfill areas 1 and 2
13 Historic use of mist suppressants at the Hawker de Havilland and Pacific Turbine facility
14 Aviation hydraulic fluid (location not identified)

0 250 500 m

N

Note:
PFOS was not detected in the NETS site investigation by JBS+6 (2016). However PFHxS was detected and has been shown on this figure.

Figure A-1 | Potential PFAS sources and historical PFOS sampling results

JACOBS

JACOBS NSW SPATIAL - GIS MAP file : IA115500_NSW_GIS_F001_A3_r1v3_SamplingLocation | 27/10/2016

🟥 Bankstown airport

PFOS sampling location

● Groundwater sampling

○ Surface water sampling

○ Soil sampling

▨ PFOS detected (label)

▨ PFHxS detected (label)

🟨 Potential PFAS sources:

1 Use and storage of AFFF in the former fire training area.
2 Use of AFFF for fire training in the area on Link Road.
3 Use of AFFF for fire training in the north east of the Airport, near Schofields Flying Club
4 Use and storage of AFFF in the former fire station area
5 Fire incident on runway 29R on 7/10/2002 (location not identified)
6 Fire incident in former Qantas test cell on 9/11/2002
7 Fire incident on runway in Southern Triangle on 11/11/2003
8 Fire incident near former fire training area in 2005
9 Fire incident near Link Rd in 2006
10 Helicopter fire near TOLL facility in 2011
11 Storage of AFFF at the Turbomeca facility
12 Landfill areas 1 and 2
13 Historic use of mist suppressants at the Hawker de Havilland and Pacific Turbine facility
14 Aviation hydraulic fluid (location not identified)

Note:
PFOS was not detected in the NETS site investigation by JBS+6 (2016). However PFHxS was detected and has been shown on this figure.

Figure A-2 | Potential PFAS sources and historical PFOS sampling results

Appendix B. Historical Business Listings Report

Lotsearch

Historical Business Activity Report

Bankstown Airport, Bankstown, NSW 2200

Report Buffer: **100m**

Report Date: **07 Sep 2016 10:38:18**

Dataset Listing

Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Land and Property Information	11/06/2014	11/06/2014		-	-	-
UBD Business to Business Directory 1991	Hardie Grant			Not required	23	130	130
UBD Business Directory 1991 Motor Garages/Service Stations	Hardie Grant			Not required	0	3	10
UBD Business Directory 1970	Hardie Grant			Not required	83	168	168
UBD Business Directory 1970 Drycleaners & Motor Garages/Service Stations	Hardie Grant			Not required	0	4	18
UBD Business Directory 1950	Hardie Grant			Not required	19	25	25
UBD Business Directory 1950 Drycleaners & Motor Garages/Service Stations	Hardie Grant			Not required	0	0	5

Aerial Imagery 2014

Bankstown Airport, Bankstown, NSW 2200

Legend

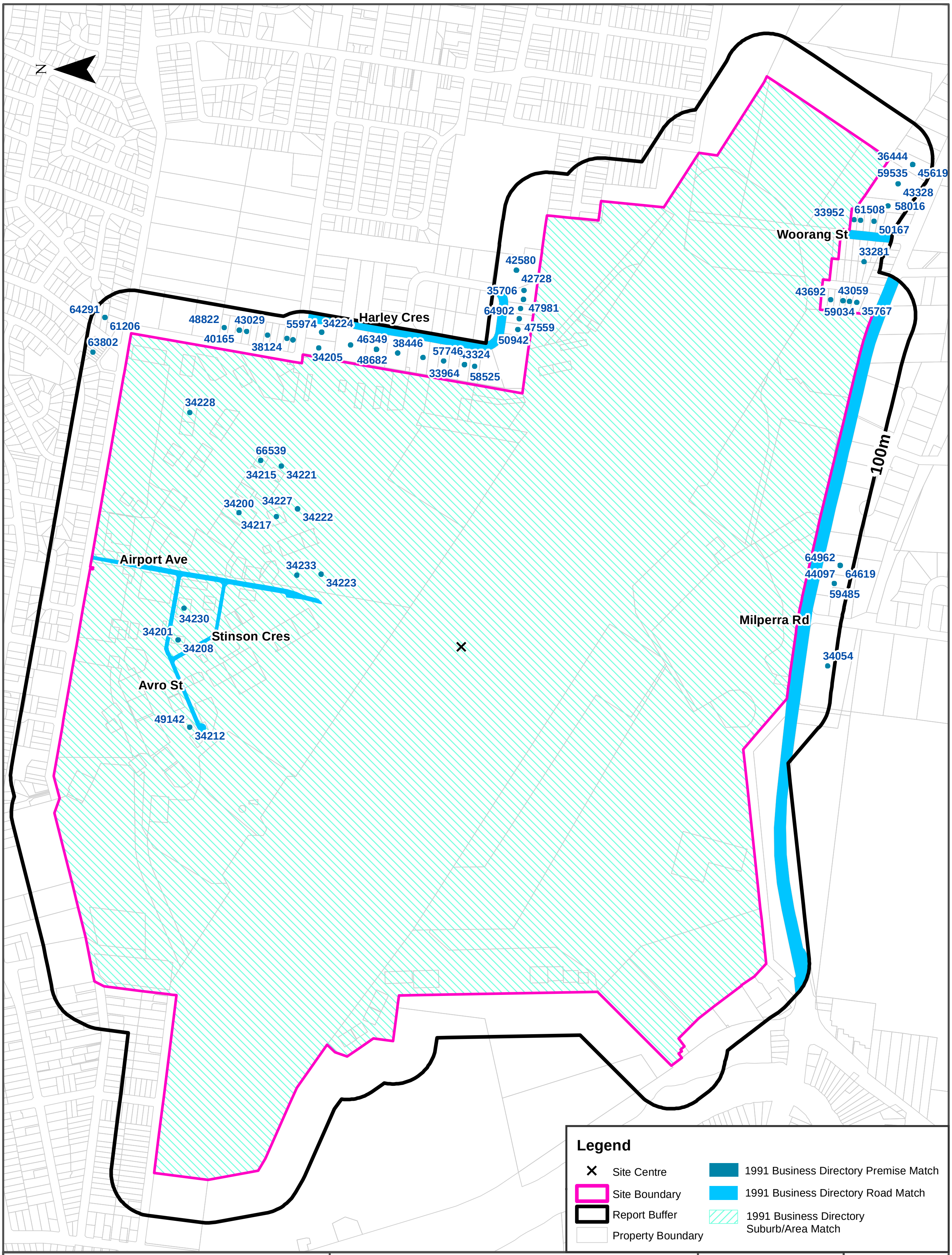
🟪 Site Boundary

⬛ Buffer 100m

Scale:	Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)	Coordinate System: GDA 1994 MGA Zone 56	Date: 07September 2016

1991 Historical Business Directory Records

Bankstown Airport, Bankstown, NSW 2200



Legend

✕ Site Centre

🟪 Site Boundary

⬛ Report Buffer

☐ Property Boundary

■ 1991 Business Directory Premise Match

■ 1991 Business Directory Road Match

▨ 1991 Business Directory Suburb/Area Match

Scale:

0 100 200 400
Meters

Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2016

Coordinate System:
GDA 1994 MGA Zone 56

Date:
07 September 2016

Historical Business Directories

Bankstown Airport, Bankstown, NSW 2200

1991 Business to Business Directory Records

Records from the 1991 UBD Business to Business Directory within 100m of the site:

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
Aircraft Component Parts Mfrs &/or Imps &/or Dists	Aero Supply	497 Avro St Bankstown Airport 2200	34201	Premise Match	0m	Onsite
Aircraft Equipment & Parts Mfrs &/or Dists	Aero Supply	497 Avro St Bankstown Airport 2200	34208	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Aero Support Pty Ltd	Hangar 271, Bankstown Airport, 2200	34215	Premise Match	0m	Onsite
Aircraft Mfrs &/or Imps &/or Dists	Aerospatiale Helicopters	Bldg 491, Avro St, Bankstown 2200	34230	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Airag Services Pty Ltd	Hangar 17, Bankstown Airport, Bankstown 2200	34217	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Chopper Shop, The	Hangar 271, Bankstown Airport, 2200	34221	Premise Match	0m	Onsite
Aircraft Mfrs &/or Imps &/or Dists	Civil Flying Service Pty Ltd	Hangar 299, Bankstown Airport, Bankstown 2200	34233	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Dasyl Avionics Pty Ltd	Hangar 273, Bankstown Airport, 2200	34222	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Fawcett Aviation Pty Ltd	Hangar 276, Bankstown Airport, 2200	34223	Premise Match	0m	Onsite
Aircraft Component Parts Mfrs &/or Imps &/or Dists	Fawcett Aviation Pty Ltd	Hangar 276, Bankstown Airport, 2200	34204	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Hawker Pacific Pty Ltd	Hangar 330, Bankstown Airport, Bankstown, 2220	66539	Premise Match	0m	Onsite
Aircraft Charter Services	Illawarra Flying School Pty Ltd	Hangar 276, Bankstown Airport Bankstown 2000	34194	Premise Match	0m	Onsite
Instrument Aircraft Mfrs &/or Imps &/or Dists	Navitron Pty Ltd	Hangar 484 Avro St Bankstown 2200	49142	Premise Match	0m	Onsite
Aircraft Equipment & Parts Mfrs &/or Dists	Navitron Pty Ltd	Hangar 484, Avro St, Bankstown 2200	34212	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	P & T Aviation	Hangar 273, Rearwin Pl, Bankstown Airport, 2200	34227	Premise Match	0m	Onsite
Aircraft Charter Services	Skywise Aviation Pty Ltd	Hangar 400, Comper St, Bankstown Airport, 2200	34200	Premise Match	0m	Onsite
Aircraft Maintenance & Repair	Winrye Aviation Pty Ltd	Hangar 506, Miles St, Bankstown Airport, 2200	34228	Premise Match	0m	Onsite
Aircraft Charter Services	Australian Flying Training School	62 Airport Ave., Bankstown Airport 2200	34189	Road Match	0m	Onsite
Aircraft Maintenance & Repair	Aviation & Marine Instrument Services Pty Ltd	Avro St, Bankstown Airport 2200	34219	Road Match	0m	Onsite
Aircraft Charter Services	Navair	Avro St, Bankstown 2200	34196	Road Match	0m	Onsite
Aircraft Maintenance & Repair	Navair	Avro St, Bankstown 2200	34226	Road Match	0m	Onsite
Aircraft Maintenance & Repair	Aviation Welding Service	Stinson Cr, Bankstown Airport 2200	34220	Road Match	0m	Onsite
Aircraft Charter Services	Adams Aviation Pty Ltd	Hangar 144, Bankstown Airport, Bankstown 2200	34188	Suburb/Area Match	0m	Onsite
Engineers Aeronautical	Hawker De Havilian Aust Pty Ltd	Milperra Rd Bankstown 2200	43302	Road Match	0m	South
Motor Garages & Service Stations	Total Milperra Service Station	Milperra Rd., Milperrra	53960	Road Match	0m	South
Fencing Contractors	Clarence Timbers	Woorang St Milperra 2214	45417	Road Match	0m	South East
Sawmillers	Lever I.R.	Woorang St Miperra 2214	61559	Road Match	0m	South East
Air Conditioning Industrial, Commercial &/or Domestic Specialists	Metalair Pty. Ltd.	18 Woorang St., Milperra 2214	33952	Premise Match	6m	South East
Tile Floor &/or Wall Mfrs &/or Imps &/or Merchants	Galasso E. Pty Ltd	64 Allingham St Condell Park 2200	64196	Premise Match	20m	North East

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
Engineers Fabricating	Aska Engineering Pty Ltd	9 Cooraban Rd Milperra 2214	43692	Premise Match	20m	South East
Salt Mfrs &/or W/salers &/or Merchants	Diamond Salt	16 Woorang St Milperra 2214	61508	Premise Match	21m	South East
Battery Mfrs &/or Dists	A & A Engineering	1 Coorban Rd, Milperra 2214	35767	Premise Match	23m	South East
Printers Lithographic (Offset)	Baybliss Pty. Ltd.	5 Cooraban Rd Milperra 2214	59034	Premise Match	24m	South East
Engineers Reclamation	Goninans Platers Pty Ltd	7 Cooraban Rd Milperra 2214	44750	Premise Match	24m	South East
Electroplaters	Goninans Platers Pty.Ltd.,	7 Cooraban Rd., Milperra. 2214	43059	Premise Match	24m	South East
Publishers	Care & Share Products Pty Ltd	44B Harley Cr Condell Park 2200	59809	Premise Match	25m	East
Greeting Card Mfrs &/or Dists	Care & Share products Pty. Ltd.	44B Harley Cr Condell Park 2200	47981	Premise Match	25m	East
Booksellers Wholesale	Care & Share Products Pty. Ltd.,	44B Harley cr., Condell Park. 2200.	36458	Premise Match	25m	East
Bathroom Equipment &/or Fittings Mfrs &/or Dists	Donson Industries Pty Ltd	44A Harley Cr, Condell Park 2200	35706	Premise Match	27m	East
Furniture Importers	Art Veneto Pty Ltd	42 Harley Cr Condell Park 2200	46858	Premise Match	29m	East
Transmission Equipment Mfrs &/or Dists	Eaton Pty Ltd	40 Harley Cr Condell Park 2200	64902	Premise Match	29m	East
Gearbox Mfrs &/or Dists	Eaton Pty Ltd	40 Harley Cr Condell Parl 2200	47559	Premise Match	29m	East
Lubricating Equipment Mfrs &/or Dists	Trilube Services Pty Ltd	38 Harley Cr Condell Park 2200	50942	Premise Match	29m	East
Lock Mfrs &/or Dists	Yale Securities	40 Harley Cr Condell Park 2200	50917	Premise Match	29m	East
Gas Works Equipment &/or Plant Mfrs &/or Dists	Sydney Valve & Fitting Pty Ltd	63 Birch St Condell Park 2200	47523	Premise Match	39m	North East
Pipe &/or Pipe Fittings Mfrs &/or Dists	Sydney Valve & Fitting Pty. Ltd	63 Birch St Condell Park 2200	57679	Premise Match	39m	North East
Hotel &/or Motel Equipment &/or Supplies	Andale Beverage System	8/10 Harley Cr Condell Park 2200	48679	Premise Match	40m	East
Hotel &/or Motel Equipment &/or Supplies	Anson Beer Plumbing Pty Ltd	8/10 Harley Cr Condell Park 2200	48682	Premise Match	40m	East
Newspapers, Journals &/or Periodicals	Anson Beer Plumbing Pty Ltd	8/10 Harley Cr Condell Park 2200	55828	Premise Match	40m	East
Glass Washing Machine Mfrs &/or Dists	Anson Beer plumbing Pty. Ltd.	8/10 Harley Cr Condell Park 2200	47869	Premise Match	40m	East
Diamond Tool Mfrs &/or Dists	Boart Australia Ltd,	Unit 5/10 Harley Cr., Condell Park. 2200	41375	Premise Match	40m	East
Engineers General	Bretter Engineering Pty Ltd	Unit 7/10 Harley Cr Condell Park 2200	43944	Premise Match	40m	East
Blind Mfrs Supplies	Bretter Engineering Pty Ltd	Unit 7/10 Harley Cr, Condell Park 2200	36051	Premise Match	40m	East
Motor Engineers	Condell Park Automotive Repairs	Unit 6/10 Harley Cr Condell Park 2200	53100	Premise Match	40m	East
Motor Garages & Service Stations	Condell Park Automotive Repairs	Unit 6/10 Harley Cr, Condell Park 2200	53658	Premise Match	40m	East
Fork Lift Truck Hirers	Condell Park Forklifts	Unit 6/10 Harley Cr Condell Park 2200	46308	Premise Match	40m	East
Fork Lift Truck Service Maintenance &/or Repairs	Condell Park Forklifts	Unit 6/10 Harley Cr Condell Park 2200	46349	Premise Match	40m	East
Aircraft Maintenance & Repair	Hawker Pacific Pty Ltd	4 Harley Cr, Bankstown Airport 2200	34224	Premise Match	40m	East
Aircraft Component Parts Mfrs &/or Imps &/or Dists	Hawker Pacific Pty Ltd	4 Harley Cr, Bankstown Airport 2200	34205	Premise Match	40m	East
Partition Mfrs &/or Dists	J.A.R.R. Partitions Pty. Ltd.	Unit 2/10 Harley Cr. Condell Park 2200	56879	Premise Match	40m	East
Plasterers Supplies & Equipment	Modern Interior Linings Pty. Ltd.	24 Harley Cr Condell Park 2200	57746	Premise Match	40m	East
Carriers &/or Cartage Contractors	Nash, John Transport Pty. Ltd.,	14 Harley Cr., Condell Park 2200	38446	Premise Match	40m	East
Plastic Bottle &/or Container Mfrs &/or Dists	Plimco Pty. Ltd.	2/20 Harley Cr Condell Park 2200	57809	Premise Match	40m	East
Furnace &/or Combustion Equipment Mfrs &/or Imps &/or Dists	Prior Industries Pty Ltd	Unit 9/10 Harley Cr Condell Park 2200	46797	Premise Match	40m	East
Boiler Plant Mfrs &/or Imps &/or Dists	Prior Industries Pty Ltd	Unit 9/10 Harley Cr, Condell Park 220	36298	Premise Match	40m	East

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
Instrument Industrial Mfrs &/or Imps &/or Dists	Sentinel Controls	Unit 1/10 Harley Cr Condell Park 2200	49231	Premise Match	40m	East
Electrical Contractors	Sentinel Controls,	Unit.1/10 Harley Cr, Condell Park 2200	42573	Premise Match	40m	East
Engineers Air Conditioning	Sainsbury J & Co Pty Ltd	28 Harley Cr Condell Park 2200	43324	Premise Match	41m	East
Engineers Combustion &/or Furnace	Sainsbury J & Co Pty Ltd	28 Harley Cr Condell Park 2200	43407	Premise Match	41m	East
Air Conditioning Industrial, Commercial &/or Domestic Specialists	Sainsbury, J. & C. Co. Engineers Pty. Ltd.	28 Harley Cr., Condell Park 2200	33964	Premise Match	41m	East
Powder Coating Equipment Service	Service Powder Coating Pty. Ltd.	30 Harley Cr Condell Park 2200	58525	Premise Match	41m	East
Sports Goods Mfrs &/or Imps &/or W/salers	York Barbell Pty Ltd	Unit 2/28 Harley Cr Condell Park 2200	62946	Premise Match	41m	East
Engineers Air Conditioning	Smith A E & Son Pty Ltd	291 Milperra Rd Milperra 2214	43328	Premise Match	47m	South East
Instrument Industrial Mfrs &/or Imps &/or Dists	Automation Instrument Service	47 Birch St Bankstown	49187	Premise Match	49m	North East
Instrument Measuring Mfrs &/or Imps &/or Dists	Automation Instrument Service	47 Birch St Bankstown 2200	49249	Premise Match	49m	North East
Instrument Repairers	Automation Instrument Service	47 Birch St Bankstown 2200	49310	Premise Match	49m	North East
Engineers Electronic	Automation Instrument Service	47 Birch St Bankstown 2208	43655	Premise Match	49m	North East
Electronic Equipment Maintenance &/or Repairs	Automation Instrument Service,	47 Birch st, Bankstown, 2200.	42873	Premise Match	49m	North East
Electronic Equipment Mfrs &/or Dists	Automation Instrument Service,	47 Birch st, Bankstown, 2200.	42911	Premise Match	49m	North East
Computer Hardware Mfrs &/or Imps &/or Dists	Automation Statham Pty. Ltd.,	47 Birch St, Bankstown 2200	40033	Premise Match	49m	North East
Computer Sales &/or Services	Automation Statham Pty. Ltd.,	47 Birch St, Bankstown 2200	40165	Premise Match	49m	North East
Instrument Industrial Mfrs &/or Imps &/or Dists	Barbe Colman	47 Birch St Bankstown	49189	Premise Match	49m	North East
Hydraulic Hose Mfrs &/or Dists	Esdan Flavell Pty Ltd	43 Birch St condell Park 2200	48822	Premise Match	49m	North East
Cardboard Box &/or Carton &/or Tube Mfrs &/or Suppliers	Inpress Boxes	61 Birch St., Condell Park 2200	38124	Premise Match	49m	North East
Mining Machinery &/or Equipment Mfrs &/or Imps &/or Dists	Traction Controls Pty Ltd	47 Birch St Bankstown 2200	51898	Premise Match	49m	North East
Electronic Equipment Mfrs &/or Dists	Traction Controls Pty Ltd	47 Birch st, Bankstown, 2200.	43029	Premise Match	49m	North East
Rectifier Mfrs &/or Dists	Traction Controls Pty Ltd	47 Birch Street, Bankstown. 2200	60892	Premise Match	49m	North East
Electroplaters Equipment &/or Supplies	Traction Controls Pty. Ltd.	47 Birch St, Bankstown 2200	43098	Premise Match	49m	North East
Electric Vehicle Mfrs &/or Dists	Traction Controls Pty. Ltd.	47 Birch St, Bankstown. 2200	42371	Premise Match	49m	North East
Rectifier Mfrs &/or Dists	Traction Controls Pty. Ltd.	47 Birch St, Bankstown. 2200	60893	Premise Match	49m	North East
Electric Switch & Control Gear Mfrs &/or Imps &/or Dists	Traction Controls Pty. Ltd.,	47 Birch St., Bankstown. 2200.	42327	Premise Match	49m	North East
Lighting Equipment Industrial Mfrs &/or Imps &/or Dists	Wadey Walter & Co Pty Ltd	55 Birch St Condell Park 2200	50828	Premise Match	49m	North East
Motor Garages & Service Stations	Wright JC & Co. Pty Ltd	49 Birch St., Bankstown	54000	Premise Match	49m	North East
Kitchen Units Mfrs &/or Dists &/or Installers	Forbena Pty Ltd	12Woorang St., Milperra, N.S.W. 2214	50166	Premise Match	49m	South East
Kitchen Units Mfrs &/or Dists &/or Installers	Forbena Pty. Ltd.	12 Woorang St., Milperra. 2214	50167	Premise Match	49m	South East
Electrical Supplies &/or Appliances Mfrs &/or W/salers	Solar Electric & Engineering Supplies Pty. Ltd.	46 Harley Cr, Condell Park. 2200	42726	Premise Match	51m	East
Electrical Contractors	Star Electrical Co. Pty. Ltd.	46 Harley Cr., Condell Park 2200	42580	Premise Match	51m	East
Electrical Supplies &/or Appliances Mfrs &/or W/salers	Star Electrical Co. Pty. Ltd.	46 Harley Cr., Condell Park. 2200.	42728	Premise Match	51m	East
Electric Lamp Globe &/or Tube Mfrs &/or Dists	Bryce, Robert & Co. Ltd.	287 Milperra Rd., Revesby. 2212	42028	Premise Match	53m	South East

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
Engineers Filtration	Industrial Equipment	287 Milperra Rd Revesby 2212	43853	Premise Match	53m	South East
Filter Mfrs &/or Dists	Industrial Equipment	287 Milperra Rd Revesby 2212	45619	Premise Match	53m	South East
Propeller Repairs	Intergraphika	287 Milperra Rd Revesby 2212	59535	Premise Match	53m	South East
Bookbinders Supplies	Intergraphika,	287 Milperra Rd., Revesby.2212	36444	Premise Match	53m	South East
Plastic Moulders	Bell Plastics Sydney Pty. Ltd.	297 Millperra Rd Revesby 2212	58016	Premise Match	56m	South East
Refrigeration Equipment Mfrs &/or Dists	Coldright Heat Transfer Products	5/60 Allingham St Bankstown 2200	60993	Premise Match	57m	North East
Office Equipment &/or Supplies Mfrs &/or Imps &/or W/salers	Consol Steel Products Pty Ltd	Unit 4/60 Allingham St Condell Park 2200	55974	Premise Match	57m	North East
Electrical Contractors	Luka Electrical Pty. Ltd.	Unit 5/60 Allingham St., Condell Park 2200	42535	Premise Match	57m	North East
Motor Engineers	R & B Auto Repairs	Unit 2/60 Allingham St Condell Park 2200	53398	Premise Match	57m	North East
Tyre Dealers &/or Retreaders &/or Vulcanisers	R & B Auto Repairs	Unit 2/60 Allingham St Condell Park 2200	65332	Premise Match	57m	North East
Motor Panel Beaters &/or Spray Painters	R & D Smash Repairs	Unit 1/60 Allingham St, Condell Park 2200	54714	Premise Match	57m	North East
Air Conditioning Units &/or Machinery Mfrs &/or Dists	VAC Equipment (NSW) Pty Ltd	5/60 Allingham St, Bankstown 2200	34049	Premise Match	57m	North East
Engineers Refrigeration	VAC Equipment Pty Ltd	5/60 Allingham St Bankstown 2200	44764	Premise Match	57m	North East
Abrasive Blasting	B.G.C. Marine Services Pty Ltd	321 Milpera Rd., Revesby 2212	33281	Premise Match	58m	South East
Motor Engineers	Anka J & B Automotives Pty Ltd	Harley Cr Condell Park 2200	52976	Road Match	61m	East
Furniture Mfrs &/or W/salers Office	Betterbuilt Furniture Pty Ltd	Harley Cr Condell Park 2200	47185	Road Match	61m	East
Furniture Mfrs &/or W/salers General	Lavender Furniture	Harley Cr Condell Park 2200	47078	Road Match	61m	East
Printing Ink Mfrs &/or Dists	Premier Inks	258 Milperra Rd Milperra 2214	59485	Premise Match	63m	South
Fence &/or Gate Mfrs &/or Dists	Callan Wrought Iron	16/254 Milperra Rd Milperra 2214	45364	Premise Match	68m	South
Security Doors &/or Windows &/or Grilles	Callan Wrought Iron	16/254 Milperra Rd., Milperra. 2214	61858	Premise Match	68m	South
Window Frame Mfrs &/or Dists Aluminum	F & H Aluminum Windows & Doors	3/254 Milperra Rd Milperra 2214	66245	Premise Match	68m	South
Toolmakers	H.K Engineering	4/254 Milperra Rd Milperra 2214	64619	Premise Match	68m	South
Engineers General	H.K. Engineering	4/254 Milperra Rd Milperra 2214	44097	Premise Match	68m	South
Kitchen Units Mfrs &/or Dists &/or Installers	Kitchen Place	2/254 Milperra Rd Milperra 2214	50218	Premise Match	68m	South
Cabinet Makers	Kitchen Place, The	2/254 Milperra Rd., Milperra. 2214	37868	Premise Match	68m	South
Kitchen Units Mfrs &/or Dists &/or Installers	Madouris C & N	14/254 Milperra Rd., Milperra. 2214	50234	Premise Match	68m	South
Trophy Mfrs &/or Suppliers	Trophy Factory	10/254 Milperra Rd Milperra 2214	64962	Premise Match	68m	South
Tilers &/or Slaters Roof	Harrison Ric	43 Surrey Ave Georges Hall 2198	64291	Premise Match	69m	North East
Roofing Contractors &/or Repairers	Harrison, Ric	43 Surrey Ave Georges Hall 2198	61206	Premise Match	69m	North East
Swimming Pool Mfrs &/or Construction Contractors	Pool Owners Clus Of Aust Pty Ltd	Pool Owners Club Of Aust Pty Ltd	63802	Premise Match	78m	North East
Air Control Equipment	Goyen Controls Co. Pty. Ltd.	268 Milperra Rd, Milperra 2214	34054	Premise Match	82m	South

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Bankstown Airport, Bankstown, NSW 2200

1991 Business Directory Motor Garages & Service Stations

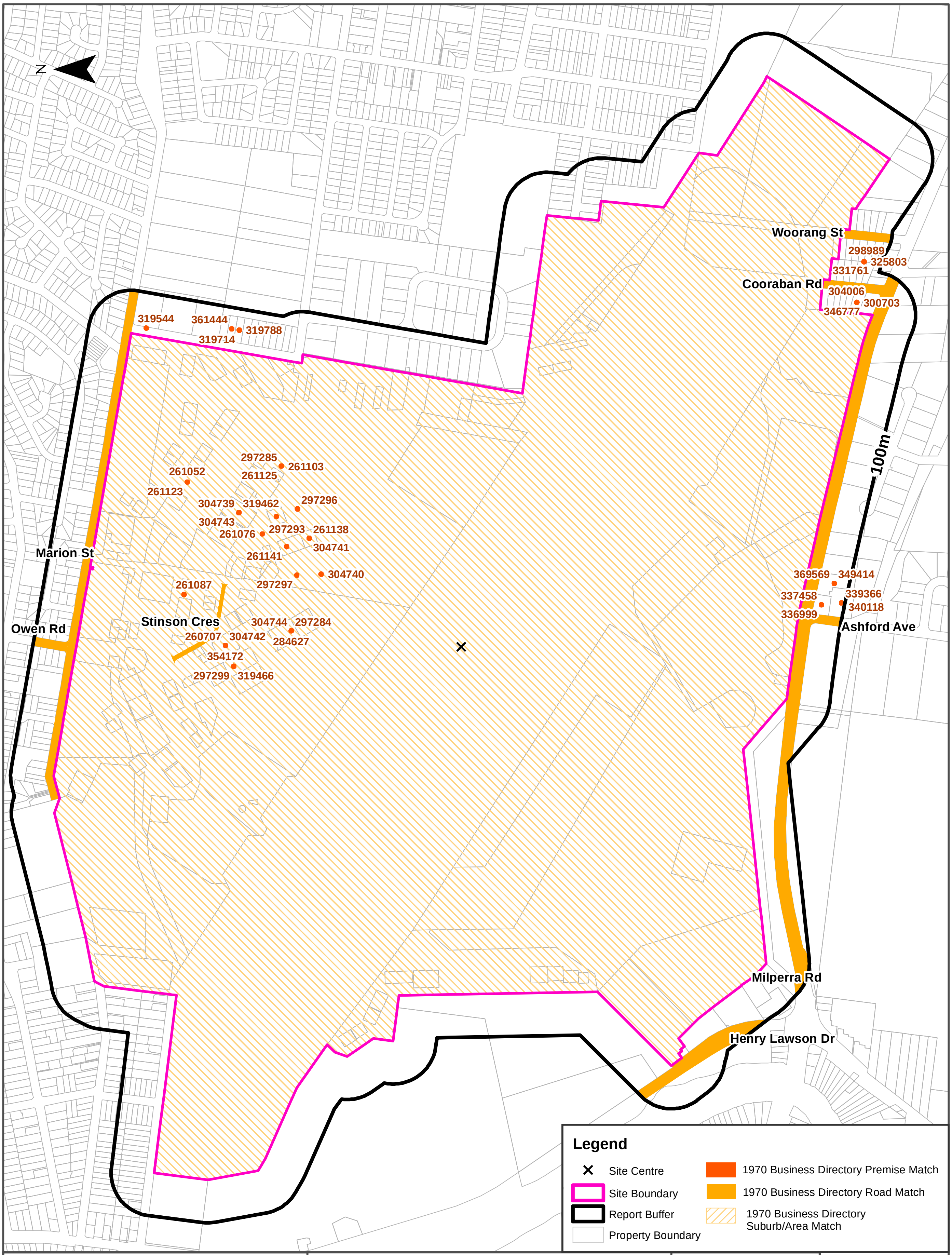
Motor Garages & Service Stations from the 1991 UBD Business Directory within 1km of the site:

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
Motor Garages & Service Stations	Total Milperra Service Station	Milperra Rd., Milperrra	53960	Road Match	0m	South
Motor Garages & Service Stations	Condell Park Automotive Repairs	Unit 6/10 Harley Cr, Condell Park 2200	53658	Premise Match	40m	East
Motor Garages & Service Stations	Wright JC & Co. Pty Ltd	49 Birch St., Bankstown	54000	Premise Match	49m	North East
Motor Garages & Service Stations	Total Self Serve	299 Milperra Rd., Revesby	53961	Premise Match	109m	South East
Motor Garages & Service Stations	Kentucky Service Station,	Coleman Park, Georges Hall. 2198	53765	Premise Match	203m	North West
Motor Garages & Service Stations	Towie Motor Repairs	7/15A Works Pl., Milperra	53963	Premise Match	393m	South
Motor Garages & Service Stations	Jeffson Automotive Repairs	5/380 Marion St., Bankstown. 2200	53754	Premise Match	421m	North East
Motor Garages & Service Stations	Jeffson Automotive Repairs,	Unit C2/380 Marion St, Bankstown. 2200	53755	Premise Match	421m	North East
Motor Garages & Service Stations	Professional Mechanical Repairs	11/66 Ashford Ave., Milperra	53785	Premise Match	643m	South
Motor Garages & Service Stations	Bullecourt Auto Port	Bullecourt Ave., Milperra. 2214	53604	Road Match	912m	South

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Historical Business Directory Records

Bankstown Airport, Bankstown, NSW 2200



Scale:

0 100 200 400
Meters

Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2016

Coordinate System:
GDA 1994 MGA Zone 56

Date:
05 September 2016

Historical Business Directories

Bankstown Airport, Bankstown, NSW 2200

1970 Business Directory Records

Records from the 1970 UBD Business Directory within 100m of the site:

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
AGRICULTURAL SPRAYING SERVICES (A235)	Aerial Agricultural Pty. Ltd., Hangar 17, Aerodrome.Bankstown	260665	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Aerial Agricultural Pty. Ltd., Hangar 17, Aerodrome.Bankstown	261101	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Aerial Agriculture Pty. Ltd., Hangar 17, Aerodrome, Bankstown	260693	Premise Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Aero Engine Services (Aust.) Pty. Ltd., Hangar 457, Bankstown Airport, 2200	261052	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Aero Engine Services (Aust.) Pty. Ltd., Hangar 457, Bankstown Airport, 2200	261123	Premise Match	0m	Onsite
AIRCRAFT ELECTRICAL EQUIPMENT SALES & SERVICE	AIRBORNE ACCESSORIES PTY LTD,BUILDING 107, AIRPORT, BANKSTOWN, 2200	261076	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Ansett General Aviation Pty. Ltd., Hangar 14, Bankstown Aerodrome	261082	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Ansett General Aviation Pty. Ltd., Hangar 14, Bankstown Aerodrome	261102	Premise Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Ansett General Aviation Pty. Ltd., Hangar 14, Bankstown Aerodrome	261055	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Ansett General Aviation Pty. Ltd., Hangar 14, Bankstown Aerodrome	261124	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Ansett General Aviation Pty.Ltd,Hangar 14,Bankstown Aerodrome	297284	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Austersene Pty.Ltd,Hangar 271,Aerodrome,Bankstown	297285	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Austerserve Pty. Ltd., Hangar 271, Aerodrome, Bankrtown	261103	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Austerserve Pty. Ltd., Hangar 271, Aerodrome, Bankstown	261084	Premise Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Austerserve Pty. Ltd., Hangar 271, Aerodrome, Bankstown	261057	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Austerserve Pty. Ltd., Hangar 271, Aerodrome, Bankstown	261125	Premise Match	0m	Onsite
AIR SERVICES OPERATORS (A265)	Austerserve Pty. Ltd., Hangar_271, Aerodrome, Bankstown	260988	Premise Match	0m	Onsite
AIRCRAFT RADIO EQUIPMENT-SALES & SERVICE	AVIOTRONICS PTY LIMITED,HANGAR 120, AIRPORT, BANKSTOWN, N.S.W, 2200	261144	Premise Match	0m	Onsite
RADIO &/OR TELEVISION SALES & SERVICEMEN (R090)	Aviotronics Pty. Ltd.,Hangar 120,Bankstown AerodromeBANKSTOWN	354172	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Avmar Pty Limited, Bldg 422, Bankstown Airport	261087	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Commercial Aviation Pty. Ltd., Hangar 400, BankstownAirport	260698	Premise Match	0m	Onsite
FLYING SCHOOLS (F395)	Commercial Aviation Pty.Ltd.,Hangar 400,BankstownAirport	304739	Premise Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Fawcett Aviation Pty. Ltd., Hangar 276, Aerdrme, Bnkstwn	261062	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Fawcett Aviation Pty. Ltd., Hangar 276, Aerodrome, Bankstown	261090	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Fawcett Aviation Pty. Ltd., Hangar 276, Aerodrome, Bankstown.	261133	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Fawcett Aviation Pty. Ltd., Hangar 276, Aerodrome, Bnkstwn	261107	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Fawcett Aviation Pty.Ltd.,Hangar 276,Airport Bnkstwn	297289	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Illawarra Flying School Pty. Ltd., Hangar 276, Airport,Bankstown	260702	Premise Match	0m	Onsite
FLYING SCHOOLS (F395)	illawarra Flying School Pty.Ltd.,Hangar 276,Airport,Bankstown	304740	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Jamieson & Walker,Hangar 276,Airfield,Bankstown	297292	Premise Match	0m	Onsite

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
AIRCRAFT COMPONENT PARTS MFRS (A270)	Kingsford Flying Service Pty. Ltd., Hangar 274, Bankstown Airport	261066	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Kingsford Flying Service Pty. Ltd., Hangar 274, Bankstown Airport	261111	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Kingsford Flying Service Pty. Ltd., Hangar 274, Bankstown Airport	261116	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Kingsford Flying Service Pty. Ltd., Hangar 274, Bankstown Airport	261138	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Kingsford Flying Service Pty.Ltd,Hangar 274,Bankstown Airport	297293	Premise Match	0m	Onsite
FLYING SCHOOLS (F395)	Kingsford Flying Service Pty.Ltd.,Hangar 274,Bankstown Airport.	304741	Premise Match	0m	Onsite
AIR SERVICES OPERATORS (A265)	Kingsford Smith Flying Service PtyLimited, Hangar 274,Aerodrome, Bankstown	260999	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Kingsford Smith Flying Services Pty. Ltd., Hanger 274 Bankstown Aerodrome	261093	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Kingsford-Smith Flying Service Pty. Ltd., Hangar 274,Bankstown Aerodrome	260704	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Marshall Airways, Hangar 273, Aerodrome, Bankstown	261112	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Marshall Airways, Hangar 273, Bankstown Aerodrome	260705	Premise Match	0m	Onsite
AIR SERVICES OPERATORS (A265)	Marshall Airways, Hangar 273, Bankstown Aerodrome.72 3957	261001	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Marshall Airways,Hangar 273,Aerodrome,Bankstown.	297296	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Milton, John Pty. Ltd., Hangar 16, Bankstown Aerodrome	261141	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Milton, John Pty. Ltd., Hangar 16, Bankstown Aerodrome	261114	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Navair Pty. Ltd., Hangar 120, Airport, Bankstown	261142	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Navair Pty. Ltd., Hangar 120, Airport, Bankstown	260707	Premise Match	0m	Onsite
PHOTOGRAPHERS-AERIAL (P264)	Navair Pty. Ltd.,Hangar 120,Airport,Bankstown	347807	Premise Match	0m	Onsite
FLYING SCHOOLS (F395)	Navair Pty.Ltd.,Hangar 120,Airport,Bankstown	304742	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Ray & Larkin Pty. Ltd., Hangar, 299, Aerodrome, Bankstown	261117	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Ray & Larkin Pty.Ltd,Hangar 299,Bankstown Aerodrome	297297	Premise Match	0m	Onsite
AIR CHARTER SERVICES (A236)	Rex Air Charter, Hangar 400, Bankstown Airport.	260708	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Rex Aviation Ltd, Hangar 400, Aerodrome, Bankstown	261118	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Rex Aviation Ltd, Hangar 400, Aerodrome, Bankstown	261098	Premise Match	0m	Onsite
INSTRUMENTS-AIRCRAFT-SPECIALISTS (I370)	Rex Aviation Ltd.,Hangar 400,Aerodrome,Bankstown	319462	Premise Match	0m	Onsite
AIRCRAFT MFRS. &/OR DISTS.(A290)	Rex Aviation Sales (N.S.W.) Pty. Ltd., Hangar 400, Aerodrome, Bankstown	261143	Premise Match	0m	Onsite
AIR SERVICES BOOKING AGENTS (A260)	Rex Aviation Sales (N.S.W.) Pty. Ltd., Hangar 400, Bankstown Aerodrome	260961	Premise Match	0m	Onsite
AIR SERVICES OPERATORS (A265)	Rex Aviation Sales (N.S.W.) Pty. Ltd., Hangar 400, Bankstown Aerodrome	261007	Premise Match	0m	Onsite
FLYING SCHOOLS (F395)	Rex Flying School Commercial Aviation,Hangar 400,Bankstown Airport.	304743	Premise Match	0m	Onsite
CLUBS & SPORTING BODIES (C487)	Royal Aero Club of N.S.W(The), Hangars 14 & 15, Airport,Bankstown	284627	Premise Match	0m	Onsite
FLYING SCHOOLS (F395)	Royal Aero Club of N.S.W.(The),Hangars 14 & 15,Airport,Bankstown	304744	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Wilmor Accessories Pty. Ltd., Hangar 131, Bankstown Aerodrome	261120	Premise Match	0m	Onsite
INSTRUMENTS-AIRCRAFT-SPECIALISTS (I370)	Wilmor Accessories Pty. Ltd.,Hangar 131,BankstownAerodrome	319466	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Wilmor Accessories Pty.Ltd,Hangar 131,Bankstown Aerodrome	297299	Premise Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Armstrong Airwork Pty Ltd, Stinson Cres., Bankstown Airport	261083	Road Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Armstrong Airwork Pty. Ltd., Stinson Cres, BankstownAirport	261056	Road Match	0m	Onsite
INSTRUMENTS-AIRCRAFT-SPECIALISTS (I370)	Armstrong Airwork Pty. Ltd.,Stinson Cr.,Bankstown Airport	319454	Road Match	0m	Onsite

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Aviation Welding Service, Stinson Cres, Bankstown Aerodrome	261105	Road Match	0m	Onsite
WELDERS-ELECTRIC &/OR OXY(W145)	Aviation Welding Service,Stinson Cres,Bankstown Aerodrome	373449	Road Match	0m	Onsite
TUBE BENDERS (T695)	Aviation Welding Service,Stinson Cres.,Bankstown Aerodrome	371399	Road Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Airborne Accessories Pty. Ltd., Bankstown Airport, Bankstown, 2200	261053	Suburb/Area Match	0m	Onsite
INSTRUMENTS-AIRCRAFT-SPECIALISTS (I370)	Airborne Accessories Pty. Ltd.,Bankstown Airport,Bankstown,2200	319452	Suburb/Area Match	0m	Onsite
RADIO TRANSMITTER MFRS. (R103)	Airborne Radio Services, Bankstown Airport, Bankstown	354664	Suburb/Area Match	0m	Onsite
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Airporn Accessories Pty. Ltd., Bankstown Airport, Bankstown, 2200	261081	Suburb/Area Match	0m	Onsite
ASSOCIATIONS-EMPLOYERS INDUST.& PROFESSIONAL (A610)	Association of Commercial Flying Organisations of Aust.,Bankstown Aerodrome, Bankstown	263607	Suburb/Area Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Jamieson & Walker Pty. Ltd., Airport, Bankstown	261110	Suburb/Area Match	0m	Onsite
CLUBS & SPORTING BODIES (C487)	Truscott Club for Aeronauts (The), Aerodrome, Bankstown	284719	Suburb/Area Match	0m	Onsite
ASSOCIATIONS & SOCIETIES (A612)	Ultra-Light Aircraft Association of Australia, BankstownAirport	263231	Suburb/Area Match	0m	Onsite
AIRCRAFT COMPONENT PARTS MFRS (A270)	Wilmor Pty. Ltd., Bankstown Aerodrome, Bankstown	261075	Suburb/Area Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Wiltshire Engineering Co, Bankstown Aerodrome, Bankstown	261121	Suburb/Area Match	0m	Onsite
ENGINEERS-AERONAUTICAL (E480)	Wiltshire Engineering Co,Bankstown Aerodrome,Bankstown	297300	Suburb/Area Match	0m	Onsite
ENGINEERS-GENERAL &/OR MFRG.&/OR MECHANICAL (E615)	Wiltshire Engineering Co.,Bankstown Aerodrome,Bankstown	299792	Suburb/Area Match	0m	Onsite
ENGINEERS-HYDRAULIC (E645)	Wiltshire Engineering Co.,Bankstown Aerodrome,Bankstown	300033	Suburb/Area Match	0m	Onsite
BUILDING SOCIETIES & COMPANIES (B824)	Bankstown Permanent Co-operative Building Society, Marion St, Banksown	271742	Road Match	0m	East
FLYING SCHOOLS (F395)	Chieften Aviation Pty.Ltd.,Milperra Rd.,BankstownAerodrome	304738	Road Match	0m	South
PLASTIC COATING SPECIALISTS' MATERIAL,Etc. (P548)	COATED FABRICS PTY. LTD,MILPERRA RD.,MILPERRA	349319	Road Match	0m	South
PLASTIC COATING SPECIALISTS' MATERIAL,Etc. (P548)	Coated Fabrics Pty. Ltd.,Milperra Rd.,Milperra.	349320	Road Match	0m	South
TEXTILE COATERS &/OR TREATERS (T238)	Coated Fabrics Pty.Ltd.,Milperra Rd.,Milperra.	367978	Road Match	0m	South
SHEET METAL WORKERS (S230)	Crane & Engineering Co. Ltd.,Milperra Rd.,Bankstown.,	360585	Road Match	0m	South
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	De Havilland Aircraft Pty. Ltd.-, Milperra Rd, Bankrtown	261106	Road Match	0m	South
BOAT, LAUNCH & YACHT BUILDERS.&/OR REPAIRERS (B450)	De Havilland Marine, Miiperra Rd., Bankstown	267505	Road Match	0m	South
ALUMINIUM PRODUCTS MFRS. (A320)	Hawker De Havilland Aust Pty. Ltd., Milperra Rd., Bankstown	261237	Road Match	0m	South
METAL MANUFACTURERS (M256)	Hawker De Havilland Aust. Pty. Ltd.,Milperra Rd.,Bankstown	329753	Road Match	0m	South
METAL PRESSERS/STAMPERS (M268)	Hawker De Havilland Aust. Pty. Ltd.,Milperra Rd.,Bankstown	329948	Road Match	0m	South
INSTRUMENTS-AIRCRAFT-SPECIALISTS (I370)	Hawker De Havilland Aust. Pty. Ltd.,Milperra Rd.,Bankstown	319458	Road Match	0m	South
ENGINEERS-DESIGNING (E560)	Hawker De Havilland Aust.Pty.Ltd.,Milperra Rd.,Bankstown	297952	Road Match	0m	South
ENGINEERS-PRECISION (E705)	Hawker de Havilland Aust.Pty.Ltd.,Milperra Rd.,Bankstown	300408	Road Match	0m	South
ENGINE IMPORTERS &/OR DISTRIBUTORS (E435)	Hawker De Havilland Aust.Pty.Ltd.,Milperra Rd.,Bnkstwn.	296988	Road Match	0m	South
AIRCRAFT COMPONENT PARTS MFRS (A270)	Hawker de Havilland AustPty. Ltd., Milperra Rd, Bankstown	261063	Road Match	0m	South
SHEET METAL WORKERS (S230)	Hawker De Havllland Aust. Pty. Ltd.,Milpejra Rd.,Bankstown	360633	Road Match	0m	South
PAPER BAG MFRS. &/OR DISTS. (PI 12)	St Regis-ACI Pty. Limited, Incorporating Bates A/asia. Pty. Ltd.,Milperra Rd.,Bankstown	346954	Road Match	0m	South
BAG & SACK MANUFACTURERS (B040)	St. Regis-A.C.I. Pty. Ltd, Incorporating Bates A/Asia Pty.Ltd., Milperra Rd., Bankstown	264374	Road Match	0m	South
BAG & SACK MERCHANTS (B045)	St. Regis-A.C.I. Pty. Ltd, Incorporating Bates A/Asia Pty.Ltd., Milperra Rd., Bankstown	264402	Road Match	0m	South

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
PLASTIC FABRICATORS Cr VACUUM FORMERS (P556)	St. Regis-ACI Pty. Limited (Inc. Bates A/asia Pty. Ltd.),Milperra Rd.,Bankstown	349563	Road Match	0m	South
MOTOR GARAGES & ENGINEERS (M6S6)	Total Service Station,Milperra Rd.MILPERRA	338773	Road Match	0m	South
FOUNDERS-NON-FERROUS (F540)	Campbell Giilman & Co.Pty.Ltd.,Lot 104 Corraban Rd.,Milperra	306079	Road Match	0m	South East
PATTERN MAKERS-ENGINEERING (P198)	Campbell,Gillman & Co. Pty. Ltd.,Lot 104,Cooraban Rd.,Milperra	347347	Road Match	0m	South East
FENCING CONTRACTORS (F095)	Clarence Timbers,Woorang St,Milperra	302291	Road Match	0m	South East
ENGINEERS-STRUCTURAL (E165)	McGlone, J. Pty. Ltd., Cooraban Rd., Milperra	301143	Road Match	0m	South East
BAKERS' & PASTRYCOOKS' MACHINERY MFRS., IMP&/OR DISTS (B070)	McGlone, JPty. Ltd., Cooraban Rd., Milperra	264459	Road Match	0m	South East
ENGINEERS-FABRICATING (E580)	McGlone,J,Pty.Ltd.,Cooraban Rd.,Milperra	298559	Road Match	0m	South East
STEEL ERECTORS (S569)	McGlone,J. Pty. Ltd.,Cooraban Rd.,Milperra	365103	Road Match	0m	South East
STEEL FABRICATORS (S673)	McGlone,J. Pty. Ltd.,Cooraban Rd.,Milperra	365306	Road Match	0m	South East
ENGINEERS-GENERAL &/OR MFRG.&/OR MECHANICAL (E615)	McGlone,J.Pty.Ltd.,Cooraban Rd.,Milperra	298960	Road Match	0m	South East
MOULD & ROLL ENGRAVERS	Swane's Joinery Pty. Ltd.,Woorang St.,' Milperra	342891	Road Match	0m	South East
JOINERY MANUFACTURERS (J240)	Swane's Joinery Pty. Ltd.,Woorang St.,Milperra	321901	Road Match	0m	South East
TIMBER MERCHANTS (T385)	Swane's Joinery Pty.Ltd.,Woorang St., Mllperra	369066	Road Match	0m	South East
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Kentucky Service Station,Henry Lawson Drv.BANKSTOWN	341242	Road Match	0m	West
INSTRUMENTS-INDUSTRIAL-MFRS.&/OR DISTRIBUTORS (1400)	Automation Instrument Services. 7 Birch St.,Bankstown	319544	Premise Match	16m	North East
GROCERS-RETAIL (G655)	Sears,G. H. J. & P.,Owen Rd.,Bankstown	312990	Road Match	20m	North
GROCERS-RETAIL (G655)	Svars,G. H. J. & P.,Owen Rd.,Bankstown	313060	Road Match	20m	North
PAINTERS-SPRAY (P096)	Brookhouse,C. & Son Pty. Ltd.,1 Cooraban Rd.,Milperra	346777	Premise Match	23m	South East
ELECTRIC LIGHT FITTINGS (SHADES,STANDARD BRACKETS,ETC)MFRS.&/OR DISTS. (E165)	Brookhouse,C.& Son Pty.Ltd,1 Cooraban Rd,Milperra	293821	Premise Match	23m	South East
FLEXIBLE SHAFTING & TUBING MFRS.&/OR DISTS.(F295)	Brookhouse,C.& Son Pty.Ltd.,1 Cooraban Rd.,Milperra	304006	Premise Match	23m	South East
ENGINEERS-REPETITION (E735)	Brookhouse,C.& Son Py.Ltd.,1 Cooraban Rd.,Milperra	300703	Premise Match	23m	South East
MATERIAL-HANDLING EQUIP.MANUFACTURERS (M164)	Hyster Australia Pty. Ltd.,Ashford Ave.,Milperra	325840	Road Match	29m	South
LOGGING MACHINERY-MFRS.&/OR DISTRIBUTORS O.680)	Hyster Australia Pty. Ltd.,Ashford Ave.,Milperra	323867	Road Match	29m	South
ROAD MAKING MACHINERY IMPORTS. &/OR DISTS. (R365)	Hyster Australia Pty. Ltd.,Ashford Ave.,Milperra	357402	Road Match	29m	South
FORK-LIFT TRUCK MFRS. (F515)	Hyster Australia Pty.Ltd.,Ashford Ave.,Milperra	305935	Road Match	29m	South
EARTH MOVING EQUIP.MFRS.,IMPORTERS &/OR DISTS. (E020)	Hyster Australia Pty.Ltd.,Ashford Ave.,Milperra	292974	Road Match	29m	South
MOTOR ENGINE RECONDITIONERS (M624)	Buchanan,E.,262 Milperra Rd.,Revesby	336999	Premise Match	45m	South
MOTOR GARAGES & ENGINEERS (M6S6)	Buchanan,E.,262 Milperra Rd.REVESBY	337458	Premise Match	45m	South
INSTRUMENTS-ELECTRICAL-MANUFACTURERS (I390)	Automation Instrument Services,47 Birch St.,Bankstown	319497	Premise Match	49m	North East
INSTRUMENT REPAIRERS (I360)	Automation Instrument Services,47 Birch St.,Bankstown	319335	Premise Match	49m	North East
INSTRUMENT-MEASURING-MFRS&/OR IMPORTS. &/OR DISTS. (I410)	Automation Instrument Services,47 Birch St.,Bankstown	319373	Premise Match	49m	North East
INSTRUMENTS-AIRCRAFT-SPECIALISTS (I370)	Automation Instrument Services,47 Birch St.,Bankstown	319455	Premise Match	49m	North East
ELECTRONICS-INDUSTRIAL CONTROL EQUIPMENT MFRS.(E360)	Automation Instrument Services,47 Birch St.,Bankstown	296471	Premise Match	49m	North East
ELECTRONIC EQUIPMENT MFRS.&/OR DISTRIBUTORS (E355)	Automation Instrument Services,47 Birch St.,Bankstown	296328	Premise Match	49m	North East
ENGINEERS-ELECTRONIC (E575)	Automation Instrument Services,47 Birch St.,Bankstown	298338	Premise Match	49m	North East

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
ELECTRIC MOTOR INSTALLATION/MAINTENANCE SPECIALISTS (E200)	Automation instrument Services,47 Birch St.,Bankstown,2200	294035	Premise Match	49m	North East
ELECTRIC MOTOR WINDING/REWINDING SPECIALISTS (E205)	Automation Instrument Services,47.Birch St.,Bankstown,2200.	294086	Premise Match	49m	North East
INSTRUMENT-MEASURING-MFRS&/OR IMPORTS. &/OR DISTS. (I410)	Exactel Instrument Co.,47 Birch St.,Bankstown	319391	Premise Match	49m	North East
INSTRUMENTS-PRECISION-MFRS.&/OR DISTRIBUTORS (1430)	Exactel Instrument Co.,47 Birch St.,Bankstown	319646	Premise Match	49m	North East
INSTRUMENTS-SCIENTIFIC-IMPORTERS,MANUFACTURERS&/OR DISTRIBUTORS (I440)	Exactel Instrument Co.,47 Birch St.,Bankstown	319714	Premise Match	49m	North East
INSTRUMENTS-SURVEYING,GEO-DETIC/GEOPHYSICAL-DIST. (1460)	Exactel Instrument Co.,47 Birch St.,Bankstown	319788	Premise Match	49m	North East
INSTRUMENTS-INDUSTRIAL-MFRS.&/OR DISTRIBUTORS (1400)	Exactel Instrument Co.,47 Birch St.,Bankstown,2200	319560	Premise Match	49m	North East
AIRCRAFT MAINTENANCE SPECIALISTS (A285)	Martin Aviation Pty. Ltd., 45 Birch St, Bankstown	261113	Premise Match	49m	North East
AIRCRAFT COMPONENT PARTS MFRS (A270)	Martin Aviation Pty. Ltd., 45 Birch St, Bankstown	261069	Premise Match	49m	North East
AIRCRAFT EQUIPMENT MFRS. &/OR DISTS. (A280)	Martin Aviation Pty. Ltd., 45 Birch St, Bankstown	261095	Premise Match	49m	North East
SHOVEL MFRS./DISTRIBUTORS (S285)	Martin Aviation Pty. Ltd.,45 Birch St.,Bankstown	361444	Premise Match	49m	North East
ELECTRONIC EQUIPMENT MFRS.&/OR DISTRIBUTORS (E355)	Martin Electronics Pty.Ltd.,45 Birch St.,Bankstown	296411	Premise Match	49m	North East
ENGINEERS-LIFTING/HANDLING(E670)	Coles Cranes Ltd,321 Milperra Rd,Bankstown	300108	Premise Match	58m	South East
CRANES & DERRICKS-MFRS. &/OR DISTS. (C728)	Coles Cranes Ltd., 321 Milperra Rd., Bankstown	286213	Premise Match	58m	South East
CRANES-MOBILE-IMPORTERS &/OR DISTRIBUTORS (C731)	Coles Cranes Ltd., 321 Milperra Rd., Bankstown	286359	Premise Match	58m	South East
CRANES-MOBILE-MANUFACTURERS &/OR DISTRIBUTORS (C734)	Coles Cranes Ltd., 321 Milperra Rd., Bankstown	286370	Premise Match	58m	South East
ENGINEERS-GENERAL &/OR MFRG.&/OR MECHANICAL (E615)	Coles Cranes Ltd.,321 Milperra Rd.,Bankstown	298989	Premise Match	58m	South East
ENGINEERS-HEAVY (E630)	Coles Cranes Ltd.,321 Milperra Rd.,Bankstown	299814	Premise Match	58m	South East
ENGINEERS-FABRICATING (E580)	Coles Cranes Ltd.,321 Milperra Rd.,Bankstown	298460	Premise Match	58m	South East
MATERIAL HANDLING EQUIPMENT IMPORTS. &/OR DISTS. (M160)	Coles Cranes Ltd.,321 Milperra Rd.,Bankstown	325734	Premise Match	58m	South East
MATERIAL-HANDLING EQUIP.MANUFACTURERS (M164)	Coles Cranes Ltd.,321 Milperra Rd.,Bankstown	325803	Premise Match	58m	South East
MINING MACHINERY & EQUIPMENT IMPORTERS,DISTRIBUTORS &/OR MANUFACTURERS (M396)	Coles Cranes Ltd.,321 Milperra Rd.,Bankstown	331761	Premise Match	58m	South East
PATTERN MAKERS-ENGINEERING (P198)	Australian Tool & Jig Co. Pty. Ltd.,258 Milperra Rd.,Revesby	347339	Premise Match	63m	South
PLASTIC DIE/MOULD MFRS. (P552)	Australian Tool & Jig Co. Pty. Ltd.,258 Milperra Rd.,Revesby	349414	Premise Match	63m	South
TOOL MAKERS (T480)	Australian Tool & Jig Co.Pty.Ltd.,258 Milperra Rd.,Revesby	369569	Premise Match	63m	South
DIE & PRESS TOOL MAKERS (D231)	Australian Tool & Jig Co.Pty.Ltd.,258 Milperra Rd.,Revesby	289393	Premise Match	63m	South
MOTOR GARAGES & ENGINEERS (M6S6)	Fenquin,9 Ashford Ave.MILPERRA	337795	Premise Match	90m	South
MOTOR PAINTERS (M672)	Hickey,R. H.,9 Ashford Ave.,Milperra,2214	339366	Premise Match	90m	South
MOTOR PANEL BEATERS (M680)	Hickey,R. H.,9 Ashford Ave.,Milperra,2214	340118	Premise Match	90m	South

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Historical Business Directories

Bankstown Airport, Bankstown, NSW 2200

1970 Business Directory Drycleaners & Service Stations

Drycleaners, Motor Garages & Service Stations from the 1970 UBD Business Directory within 1km of the site:

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
MOTOR GARAGES & ENGINEERS (M6S6)	Total Service Station,Milperra Rd.MILPERRA	338773	Road Match	0m	South
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Kentucky Service Station,Henry Lawson Drv.BANKSTOWN	341242	Road Match	0m	West
MOTOR GARAGES & ENGINEERS (M6S6)	Buchanan,E.,262 Milperra Rd.REVESBY	337458	Building Match	45m	South
MOTOR GARAGES & ENGINEERS (M6S6)	Fenquin,9 Ashford Ave.MILPERRA	337795	Building Match	90m	South
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Total Service Station,Cnr. Woorang St. & Milperra Rd.MILPERRA	341576	Road Intersection	135m	South East
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Kendall's Service Station,Coleman ParkGEORGE'S HALL	341239	Building Match	203m	North West
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Ampol Miiperra Service Station,174 Milperra Rd.REVESBY	340763	Building Match	222m	South East
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Esso Servicentre (Moorebank),5 Newbridge Rd.MOOREBANK	341104	Building Match	266m	South West
MOTOR GARAGES & ENGINEERS (M6S6)	B.P. Showground Service Station,160 Milperra Rd.REVESBY	337253	Building Match	288m	South East
MOTOR GARAGES & ENGINEERS (M6S6)	Golden Fleece Service Station,138 Milperra Rd.REVESBY	337881	Building Match	476m	South East
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Kentucky Service Station,Henry Lawson Dr.GEORGE'S HALL	341241	Road Match	583m	North West
MOTOR GARAGES & ENGINEERS (M6S6)	Allround Car Repairs,135 Eldridge Rd.BANKSTOWN	337181	Building Match	778m	East
MOTOR GARAGES & ENGINEERS (M6S6)	Snodgrass,R. Motors Pty. Ltd.,109 Carrington St.REVESBY	338622	Building Match	792m	South East
MOTOR GARAGES & ENGINEERS (M6S6)	Mag Wheel Centre (The),17 Ilma St.BANKSTOWN	338187	Building Match	892m	South East
MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716)	Cullen's,Pat Service Station,110 Newbridge Rd.MOOREBANK	340999	Building Match	904m	West
MOTOR GARAGES & ENGINEERS (M6S6)	Hilltop Service Station,110 Newbridge Rd.MOOREBANK	338013	Building Match	904m	West
MOTOR GARAGES & ENGINEERS (M6S6)	Golden Fleece Service Station,112 Newbridge Rd.MOOREBANK	337879	Building Match	914m	West
MOTOR GARAGES & ENGINEERS (M6S6)	Thomas,J. W.,7 Ilma St.BANKSTOWN	338724	Building Match	957m	South East

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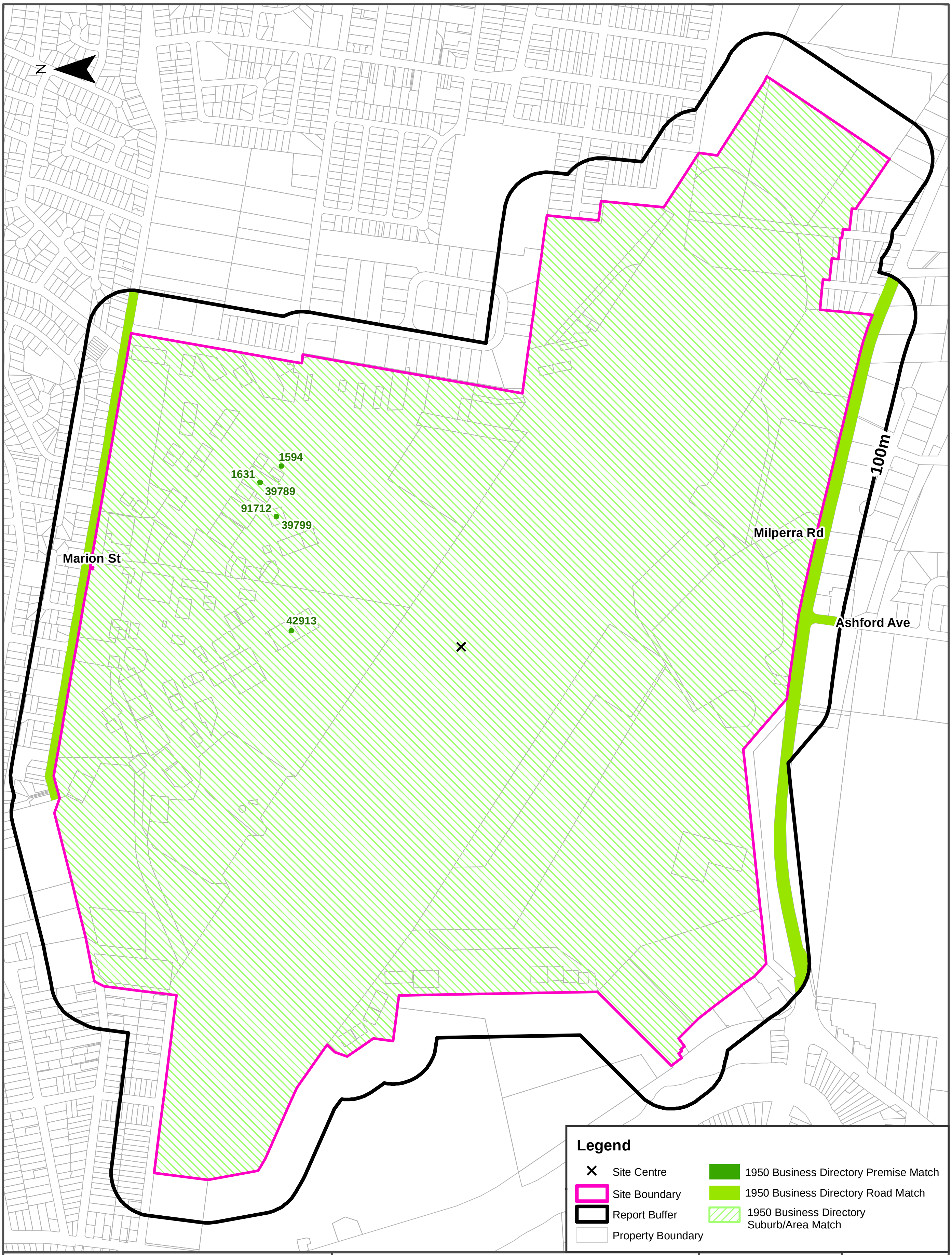
1950 Historical Business Directory Records

Bankstown Airport, Bankstown, NSW 2200



Scale:

0 100 200 400 Meters

Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
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Coordinate System:
GDA 1994 MGA Zone 56

Date:
05 September 2016

Historical Business Directories

Bankstown Airport, Bankstown, NSW 2200

1950 Business Directory Records

Records from the 1950 UBD Business Directory within 100m of the site:

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
AIR SERVICES OPERATORS	Airflite Pty. Ltd., Hangar 275, Aerodrome, Bankstown	1569	Premise Match	0m	Onsite
AIRCRAFT MAINTENANCE SPECIALISTS	Airflite Training Pty. Ltd., Hangar 275, Aerodrome, Bankstown (P.O. Box 4)	1631	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL	Airflite Training Pty. Ltd., Hangar 275, Aerodrome, Bankstown, P.O. Box 4	39789	Premise Match	0m	Onsite
AIR SERVICES OPERATORS	Curtis Madsen Aircraft Pty. Ltd., Hangar 17, Aerodrome (Box 25), Bankstown	1584	Premise Match	0m	Onsite
ELECTRICAL ENGINEERS	Curtis, Madsen Aircraft Pty. Ltd (Aero), Hangar 17, .Aerodrome (Box 25), Bankstown	38060	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL	Curtis, Madsen Aircraft Pty. Ltd., Hangar 17, Aerodrome (Box 25), Bankstown	39799	Premise Match	0m	Onsite
EXPORTERS	Graclin Import and Export Coy. Pty. Ltd., Hangar 14, Bankstown Aerodrome	42913	Premise Match	0m	Onsite
AIR SERVICES OPERATORS	Morris Air Service, Hangar 271, Aerodrome, Bankstown	1594	Premise Match	0m	Onsite
PHOTOGRAPHERS-AERIAL	Skyway Services Pty. Ltd., 17 Hangar, Bankstown Aerodrome	91712	Premise Match	0m	Onsite
ENGINEERS-AERONAUTICAL	Clyde Engineering Co. Lid, Aerodrome, Bankstown	39797	Suburb/Area Match	0m	Onsite
AIRCRAFT IMPORTERS' &/OR MANUFACTURERS REPRESENTATIVES	De Havilland Aircraft Pty. Ltd. Bankstown Aerodrome	1629	Suburb/Area Match	0m	Onsite
AIRCRAFT MANUFACTURERS & DISTRIBUTORS	De Havilland Aircraft Pty. Ltd. Bankstown Aerodrome	1638	Suburb/Area Match	0m	Onsite
AIR SERVICES OPERATORS	Kingsford Smith Aviation Service, Bankstown Aerodrome	1590	Suburb/Area Match	0m	Onsite
FLYING SCHOOLS	Kingsford Smith Aviation Service, Bankstown Aerodrome	46435	Suburb/Area Match	0m	Onsite
AIR SERVICES OPERATORS	Marshall Airways, Aerodrome, Mascot Bankstown	1591	Suburb/Area Match	0m	Onsite
AIR SERVICES OPERATORS	Mashall, S. D., Aerodrome, Bankstown	1593	Suburb/Area Match	0m	Onsite
AIR SERVICES OPERATORS	New England Airways, Aerodrome, Bankstown	1595	Suburb/Area Match	0m	Onsite
AIRCRAFT MANUFACTURERS & DISTRIBUTORS	New England Airways, Bankstown Aerodrome and Mascot	114825	Suburb/Area Match	0m	Onsite
CLUBS & SPORTS BODIES	Truscott Club for Aeronauts (The), Aerodrome, Bankstown	25452	Suburb/Area Match	0m	Onsite
ELECTRICAL SUPPLIES & APPLIANCES RETAILERS	Bankstown Electricity Show Room, Marion St., Bankstown	38381	Road Match	0m	East
ANIMAL & BIRD DEALERS	Condie, Harold, Marion St., Bankstown	1767	Road Match	0m	East
ANIMAL &/OR BIRD FOOD SUPPLIERS	Condie, Harold, Marion St., Bankstown	1773	Road Match	0m	East
POULTRY FARMERS	Tyson Bros., Milperra Rd., Bankstown	94334	Road Match	0m	South
POULTRY FARMERS	Humphris, P. G., Ashford Ave., Milperra	94083	Road Match	29m	South
POULTRY FARMERS	Thoroughgood, R. C., Ashford Ave., Milperra	94320	Road Match	29m	South

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Historical Business Directories

Bankstown Airport, Bankstown, NSW 2200

1950 Business Directory Drycleaners & Service Stations

Drycleaners, Motor Garages & Service Stations from the 1950 UBD Business Directory within 1km of the site:

Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
MOTOR GARAGES &/OR ENGINEERS	Phipps Bros., Milperra Rd., Revesby	84214	Road Match	686m	South East
MOTOR SERVICE STATIONS-PETROL, Etc.	Phipps Bros., Milperra Rd., Revesby	86287	Road Match	686m	South East
MOTOR GARAGES &/OR ENGINEERS	Buchanan, E., 108 Newbridge Rd., Moorebank	83521	Premise Match	891m	West
MOTOR SERVICE STATIONS-PETROL, Etc.	Hilltop Service Station, 110 Newbridge Rd., Moorebank	86059	Premise Match	904m	West
MOTOR GARAGES &/OR ENGINEERS	Hilltop Service Station, HO Newbridge Rd., Moorebank	83870	Premise Match	904m	West

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Document 4

Contamination Investigation

Site 1 (Link Road)

Bankstown Airport

Bankstown Airport Limited

3 | FINAL

28 September 2016

Contamination Investigation - Site 1 (Link Road), Bankstown Airport

Project no:	IA110700
Document title:	Contamination Investigation –Site 1 (Link Road), Bankstown Airport
Document No.:	1
Revision:	3
Date:	28 September 2016
Client name:	Bankstown Airport Limited
Client no:	
Project manager:	Blair Cummings
Author:	Blair Cummings/Michael Stacey
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Document history and status

Revision	Date	Description	By	Review	Approved
V1	14/07/16	Technical Review	BC	MS	MS
Draft	14/07/16	Client Review	BC	BH	MS
V2	19/08/16	Client Comments	MS	MS	MS
V3	28/09/16	AEO Review	MS	MS	MS

Contents

1 Introduction

Jacobs Group (Australia) Pty Ltd (Jacobs) was commissioned by Bankstown Airport Limited (BAL) to undertake a contamination investigation of the proposed development site known as Site 1, Link Road (referred to hereinafter as the site) located on a portion of airside land at Bankstown Airport, NSW. Based on information provided by BAL, the footprint of development at the site will occupy an area of approximately 20,000 m^2.

The location of the site is presented as **Figure 1-1**.

This report details the works undertaken during the contamination investigation undertaken at the site, field observations and the sampling results and analysis with an assessment against the limits listed in *Airports (Environment Protection) Regulations 1997* (the Airport Regulations)*, Table 1 – areas of an airport generally* and those guidelines endorsed by the NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999* as revised 2013 (NEPM 2013).

The investigation was undertaken in general accordance with the Jacobs *Proposal for Contamination and Geotechnical Investigations – Proposed Sites 1, 2 and 3, Bankstown Airport* dated 15 March 2016 and subsequent email for additional sampling dated 16 May 2016.

This report has been generally prepared in general accordance with the requirements specified for a Detailed Site Investigation as detailed in the NSW EPA (1997) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.*

2 Objectives and Scope of Works

The objectives of the contamination investigation were as follows.

- Identify the nature and extent of any pre-existing potential contamination at the site that may be encountered during development
- Identify the nature and extent of potential contamination at the site that would deem the suite unsuitable for the proposed continued airport land use (i.e. commercial/industrial land use).

The scope of works undertaken to address the objectives are detailed below. Sampling locations are presented on **Figure 2-1.**

2.1 Soil Contamination Investigation

- Undertook preliminary investigations including a detailed site inspection, review of available historical aerial photographs (held by Jacobs and BAL) and interviews with BAL staff with site knowledge
- Service locating for services by a qualified service locator and Dial Before You Dig Search
- Excavation of 20 test pit locations (A1-TP01 to A1-TP20) across the site with aid of a backhoe. All test pits were excavated to 1.0 m below ground level (bgl), intersection with the water table or excavation method refusal (whichever was shallower). 13 test pit locations (A1-TP02, A1-TP04, A1-TP05, A1-TP07, A1-TP08, A1-TP10, A1-TP11, A1-TP12, A1-TP13, A1-TP14, A1-TP16, A1-TP19, A1-TP20) were excavated to 2.5 m bgl, to assess the depth to groundwater (if observed) and were additionally used for the asbestos investigation (refer below).
- Drilling of 10 borehole locations (A1-BH01 to A1-BH10) across the site with the aid of a tracked drilling rig. All boreholes were drilled to 10 m bgl or excavation method refusal (whichever was shallower).
- The 20 test pit and 10 borehole locations completed as part of the contamination investigation meet the minimum sampling points required for site characterisation outlined in the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines* for a site with an area of 20,000 m^2.
- Soil samples were collected from the test pits and boreholes with selected samples (primary and QC samples) submitted to a National Association of Testing Authorities (NATA) accredited laboratory for laboratory analysis for a range of common contaminant compounds including Perfluorinated Chemicals (PFCs).

2.2 Asbestos Investigation

With the absence of assessment criteria for asbestos in soils in the Airport Regulations, an asbestos assessment was undertaken in accordance with the Western Australia Department of Health (May 2009) *Guidelines for the Assessment and Management of Asbestos-Contaminated Sites in Western Australia* (WADOH 2009). In accordance with *Table 1 – Triggers and Types of Asbestos Investigations* from the WADOH (2009) guidelines, Jacobs has assumed that there was a possible likelihood of asbestos being present on the site and that the asbestos (if present) could be in any form. Based on the possible likelihood, the investigation regime comprised an assessment from 15 test pit locations to be excavated as part of the contamination investigation. The scope of works for the asbestos investigation is detailed below:

- Excavation of 11 test pit locations (A1-TP02, A1-TP04, A1-TP05, A1-TP07, A1-TP08, A1-TP11, A1-TP12, A1-TP13, A1-TP14, A1-TP16 and A1-TP19) across the site with aid of a backhoe. All test pits were excavated to a depth 2.5 m bgl.

- Excavation of four test pit locations (A1-TP01, A1-TP06, A1-TP09 and A1-TP18) across the site with the aid of a backhoe. All test pits were excavated to a maximum depth of 1.2 m bgl.

- Select material excavated from the test pits was inspected for potential asbestos containing materials (ACM)

- Soil samples were collected from the test pits with selected samples submitted to a NATA accredited laboratory for ACM, fibrous asbestos (FA) and asbestos fines (AF) identification.

2.3 Groundwater Investigation

- Drilling of three boreholes (A1-GW1 to A1-GW3) at anticipated hydraulic up gradient and down gradient positions with the aid of a tracked drill rig and installation of groundwater monitoring wells. All boreholes for groundwater well installation were drilled to a maximum depth of 8 m bgl, 1 m below the observed static water level or excavation method refusal (whichever was shallower)

- Groundwater samples were collected from the wells with samples (primary and QC samples) submitted to a NATA accredited laboratory for analysis for a range of common contaminant compounds including PFCs.

- Groundwater well location heights were surveyed to site datum.

2.4 Reporting

Preparation of a report detailing the results of the contamination investigation and laboratory analysis. The report includes an assessment as to the suitability of the site for continued airport land use and an assessment as to the potential impacts to development of the site (with respect to contamination).

3 Data Quality Objectives

Data Quality Objectives (DQO) are an important component of any sampling and analysis programme as they outline the aims and objectives of the investigation program with respect to the integrity of the data collection and interpretation. In order to address the DQO and to ensure that they have been achieved the following seven-step process was undertaken. The DQO process has been adopted from the Australian Standard (AS 4482.1-2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.*

Step 1 - State the Problem

The problem was potential contamination attributable to historical site usage above the NSW EPA endorsed guidelines for commercial/industrial land use, airport regulations and protection of beneficial groundwater users and receiving environments.

Step 2 - Identify the Decision Statement

The primary decision statement that the contamination investigation will attempt to resolve is:

> "Does contamination at the site pose an unacceptable risk to human or environmental health which may prevent the development and operation of the site for continued airport use"?

Step 3 - Identify inputs to the decision

The following informational inputs were required to resolve the decision statement:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as revised 2013) - *Schedule B1 Guideline on Investigation levels for Soil and Groundwater* (NEPC, 2013)
- Airports (Environment Protection) Regulations 1997 (the Airport Regulations)
- Western Australia Department of Health (May 2009) *Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA Guidelines)*
- GHD (June 2015) *Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework*
- National Health and Medical Research Council (2008) *Guidelines for Managing Risks in Recreational Waters* (NHMRC, 2008)
- enHealth (June 2016) *Guidance Statements on Pefluorinated Chemicals – Interim Values* (enHealth, 2016).

Step 4 - Define the Boundaries of the Study

The investigation extended laterally across accessible areas of the site for coverage and to target areas of environmental interest. All locations were extended vertically to the limit of the investigation or excavation method refusal.

Step 5 - Develop a Decision Rule

The purpose of this step was to define the parameter of interest, specify the action level and combine the outputs of the previous DQO steps into an "if…then…" decision rule that defines the conditions that would cause the decision maker to choose alternative actions.

The parameters of interest (or Contaminants of Concern) have been determined based on background information and to establish baseline chemical conditions and contaminant concentrations. The action level (Site Assessment Criteria) will be used to decide if the parameter represents a potentially unacceptable risk for commercial/industrial land use, human health and/or the environment. If the measured concentration of a compound exceeds the action levels in soils, water and vapour, then this is deemed to present a potential unacceptable risk considering the current land use, adjoining land use and environmental receptors. This also indicates that refinement of the Site Assessment Criteria (SAC) by undertaking Detailed Risk Assessment (DRA) is warranted. Should this DRA action value be exceeded, remediation will be required. In some instances (such as presence of free phase hydrocarbons), the development of the DRA can be by-passed and intervention through remediation applied directly.

Step 6 - Specify Acceptable Limits on Decision Errors

There were decided to be two types of errors:

a) Deciding that the site is acceptable for continued airport use (i.e. no risk to site users and/or receptors) when it actually is not acceptable. The consequence of this error may be unacceptable health risk for site users, adjoining site users and receiving environments; or

b) Deciding that the site is unacceptable for continued airport use (i.e. risk to site users and/or receptors) when it actually is acceptable. The consequence of this error is that the client will pay for further investigation / remediation that are not necessary.

The more severe consequences are with decision error (a) since the risk of jeopardising human health and/or the environment outweighs the consequences of paying more for remediation. It will not be possible to conduct statistical hypothesis tests as the proposed sampling programme as part of this contamination investigation consists of the collection of one round of samples only.

Step 7 - Optimising the Design for Obtaining Data

The purpose of this step was to identify a resource-effective data collection design for generating data that are expected to satisfy the DQO.

The resource effective data collection design that was expected to satisfy the DQO is described in detail in **Sections 10** of this report. To ensure the design satisfies the DQO a comprehensive Quality Assurance and Quality Control Plan was implemented as described in **Section 11** of this report.

4 Site Information

The site information presented below is based on a review of readily available government information sources and information provided by BAL.

4.1 Site Identification

Based on information from NSW Department of Finance and Services, Land and Property Information Spatial Information Exchange (SIX), the site is located within the local government area (LGA) of Canterbury-Bankstown and comprises the following lots (whole or a portion of):

- Lot 5013 deposited plan (DP) 1176822
- Lot 308, DP 10774400
- Lot 309, DP 10774400
- Lot 310, DP 10774400.

4.2 Site Zoning and Landuse

The current zoning of the site is SP2 – Air Transport Facility under the Bankstown Local Environment Plan (LEP) 2015. At the time of preparing this report, the site was being used as an airport.

4.3 Geology

Review of the 1:100,000 Penrith Geological Sheet 9030 (Edition 1, 1991) indicated the site is within an area underlain by fluvial sediments. The sediments overlie Ashfield Shale of the Wianamatta Group. The fluvial sediments comprise clayey quartzose sand and clay. The Ashfield Shale comprises dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite.

4.4 Soils

Review of the 1:100,000 Penrith Soil Landscape Series Sheet 9030 (1989) indicated that the area in which the site is located has been disturbed by human activity to a depth of at least 100 cm. The original soil has been removed, greatly disturbed or buried. Most of these areas have been levelled to slopes of less than 5%. Landfill includes soil, rock, building and waste materials. The original vegetation has been completely cleared.

The natural soils underlying these disturbed areas consist of fluvial sediments of the Berkshire group of soils. The Berkshire group of fluvial sediments are typically characterised by orange heavy clays and clayey sands, often mottled and with ironstone inclusions. Due to the depositional action of the fluvial sediments, they can exhibit marked differences in soil texture, colour, stoniness and calcium carbonate content.

4.5 Hydrogeology

Groundwater within the catchment occupied by the site is expected to flow to the west and south-west towards the Georges River. Shallow groundwater beneath the site is expected to be perched above the residual weathered bedrock and to be recharged predominantly by the infiltration of surface water falling onto the unsealed surfaces of the site.

Surface water flowing across sealed taxiways and runways would be directed towards the drainage channels located to the west of the site.

The Georges River is located less than one kilometre to the west of the site.

4.6 Acid Sulfate Soils

Areas of the site are defined in the Liverpool Acid Sulfate Soil (ASS) Risk Map (Edition 2, 1997) as disturbed terrain with an elevation of 2 m to greater than 4 m AHD. Disturbed terrain is defined as filled areas, which often occur during reclamation of low-lying wetlands and floodplains for urban development. Other disturbed terrain includes areas which have been mined or dredged, or have undergone heavy ground disturbance through general urban development or construction of dams or levees.

No suspected ASS were observed in the material excavated during the contamination investigation because fill and natural soil did not exhibit the following characteristics (as defined in the ASSMAC 1998):

- Fill and soils did not exhibit a sulphurous smell
- There was no evidence of shell
- No jarositic horizons or substantial iron oxide mottling was observed; or
- Fill and soils were not classified as unripe muds (soft, buttery, blue grey or dark greenish grey) or estuarine silty sands or sands (mid to dark grey) or bottom sediments of estuaries or tidal lakes (dark grey to black).

The Bankstown Local Environment Plan (LEP) 2015 ASS map sheet defines the areas below the site as Class 3.

5 Site History

The site history has been based on a review of the report prepared by Godden Mackay Logan (April 2005) *Bankstown Airport, Heritage Management Strategy*. The Godden Mackay Logan (April 2005) report outlines the history of the entire Bankstown Airport site. It should be noted that the historical operations/activities detailed may have not been specifically undertaken on the site (i.e. Site 1). A brief outline of the site history is provided below.

- The Bankstown Airport site was formerly occupied by market gardens, poultry farms and commercial premises (including a service station) located at the corner of Milperra and Billiana Roads
- Construction of the Bankstown Aerodrome commenced in 1940
- The Royal Australian Air Force (RAAF) established at the site in late 1940. The activities undertaken by the RAAF included airfield and training operations, aircraft assembly and temporary accommodation for RAAF personnel
- The Women's Australian Auxiliary Air Force (WAAAF) established to the site in 1941. The activities undertaken by the WAAAF included training, administration and accommodation
- The US Air Force were accommodated at the site from 1942 to 1945. The site was used to as a base for a number of squadrons and accommodated the associated personnel
- The Clyde Engineering Co Pty Ltd undertook maintenance, repair and modification of aircraft from 1942
- Hawker de Havilland opened a factory in 1942 for the manufacture of aircraft and parts
- A Mobile Naval Air Base was commissioned at Bankstown in 1945. As part of this commission, hangers, taxiways and associated facilities were constructed
- From 1945 to 1950 sections of the site were used to house migrants
- The control of the Bankstown Airport was divested to the Department of Civil Aviation in 1980.

6 Preliminary Investigation

Jacobs undertook a preliminary investigation of the site to assess whether historical land use and/or activities undertaken on and/or adjacent to the site could have contaminated the site. The preliminary investigation also included an assessment of the potential for PFCs contamination in general accordance with the Department of Infrastructure and Regional Development GEM-002 *PFC – management actions advice.*

The results of the preliminary investigation were used to refine the intrusive investigation plan so as to target potential areas of interest and contaminants of concern (where identified). The results of the preliminary investigation are detailed below.

6.1 Aerial Photograph Review

Aerial photographs held by Jacobs and BAL were examined to provide a visual indication of the potential historical activities and changes which have taken place at or within areas adjoining the subject site. Historical aerial photos held by Jacobs were examined for the years 1943, 1951, 1986, 2000, 2005, 2007, 2009, 2011 and 2015, while historical aerial photos held by BAL were examined for the years 1950, 1956, 1957, 1961, 1977, 1979, 1980, 1986 and 2000. From a review of the historical aerial photos the subject site and it's surrounds appeared vacant and was covered with low lying shrubs and bushes except for some shelter and accommodation type buildings observed adjacent and directly to the north of the western portion of the site and east of the site in aerial photos from 1943. An open drain also appears to run along the southern boundary of the site. The shelter and accommodation type buildings to the north and east of the site no longer appear in aerial photos from 1950. The southern portion of the site appears to have been cleared of low lying shrubs and bushes in aerial photos from 1961 with the northern and central portions of the site still remaining vegetated. Formalised runways also appeared to the south and south east of the site. A very small shed type structure was observed directly north of the western portion of the site in aerial photos from 1979. From 1980 onwards a small round windsock type concrete pad appears on the western portion of the site. An open drainage line running diagonally north east to south west through the site was observed in aerial photos from 1986. One large and one medium rectangular storage type containers and three large hanger type structures appear directly east of the site in an aerial photo from 2000, Small aircraft appear on the concrete aprons adjacent of the three large rectangular hangers directly east of the site periodically in aerial photos from 2000 onwards. Land adjacent and directly north of the western portion of the site also appears to have been stripped of vegetation. A bus depot appears adjacent and directly north of the western portion of the site on land previously stripped of vegetation and two helipads, one located on the central portion of the site and one directly north of the site were observed in aerial photos from 2005. Land east of the site and adjacent and directly south of a large rectangular hanger appears to have been periodically used to park small planes and a truck in aerial photos from 2007 onwards. The wind sock located on the western portion of the site and helipad directly north of the site can no longer be observed in aerial photos from 2011.

6.2 Interviews

An interview was conducted with Mr Craig Smith, Facilities Management Coordinator at BAL on the 11 May 2016 prior to conducting a site inspection and walkover to gain an understanding of any potentially contaminating events or activities that may have occurred on the site in the past. Of particular interest were any fires, crashes, spills or structures that may have caused potential contamination (including PFC contamination). Anecdotal information from Mr Smith indicated that he had worked at the airport for approximately 20 years and had spoken to a few employees who had been there for a similar period of time. Mr Smith provided the following anecdotal information regarding past activities on and around the site that may have contributed to potential contamination of the site:

- A firefighting exercise had been conducted on the south eastern portion of the site within the past five years. The exercise consisted of lighting a drum on fire and having emergency services put it out with a mixture of water and foam. The exercise was identified as an activity that could have resulted in PFC contamination of surface soils and of groundwater beneath the site. This triggered the requirement for PFC analysis of groundwater and soil samples collected from across the site.
- The eastern portion of the site was identified as having been used in the past as a clay pigeon shooting range. It was noted that lead shot could be present within the surface soils across this portion of the site.
- A past plane crash site was identified directly to the north east of the site.

6.3 Site Inspection

A site inspection and walkover was conducted on 11 May 2016. During the course of the site inspection and walkover, no obvious signs of ACM, fuel or chemical spills, evidence of fires, crashes or staining of soils were observed across the surface of the site. Areas of fill material were observed across the majority of the surface of the site and consisted of a silty clay material with gravel. A small mounded area of fill material was observed on the western portion of the site.

7 Site Description

At the time of the investigation, the site was located airside and comprised a vacant grassed area and helipad. The surrounding area consisted of taxi zones for aircraft which led to the main runway, a bus depot, access roads, an open drain and large sheds, which were likely used as hangars/workshops for small aircraft.

Operations that were undertaken at the site during the time of the investigation included:

- Aircraft activity: this involved aircraft leaving the hangars adjacent and directly east of the site and travelling along the taxi zone towards the main runway
- Helicopter activity within the helipad area located on the site
- Airport vehicles travelling along the runway/taxi zone
- Possible refuelling activities within the hanger area adjacent to site
- Operation of bus depot adjacent to site.

8 Fieldwork – Soil Investigation

Jacobs undertook the contamination investigation works at the site between 24 May 2016 and 30 May 2016. The site investigation and sampling was undertaken in accordance with documented Jacobs procedures by an experienced Jacobs environmental scientist.

8.1 Sampling Pattern

Sample locations were positioned across the proposed footprint of the development (based on information provided by BAL) as follows:

- To undertake sufficient sample locations to meet the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines Table A: Minimum Sampling Points Required for Site Characterisation Based on Detecting Circular Hot Spots by Using Systematic Sampling Pattern.* The 20 test pit and 10 borehole locations (30 sample locations in total) meet the minimum sampling points required for site characterisation for a site with an area of 20,000 m^2 as outlined in the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines.*

- To undertake sufficient sample locations to meet WADOH (2009) *Table 1 – Triggers and Types of Asbestos Investigations.* Based on the possible likelihood, the investigation regime comprised an asbestos assessment from 15 test pit locations (i.e. half of the overall sample locations) excavated as part of the contamination investigation.

- To target areas of potential concern as identified during the preliminary investigation.

- To assess groundwater quality migrating onto and from the site.

Sampling locations and the proposed development footprint are presented in **Figure 2-1**.

8.2 Depth Intervals of Sampling

8.2.1 Soil Contamination Investigation

For the soil contamination investigation, soil samples were collected as follows:

- As grab samples from the surface of the site and directly from the centre of the excavator bucket at depths of approximately 0.5 m and at 1.0 m intervals or at other discrete locations where there was evidence of potential contamination (odorous or discoloured soils, erroneous waste or fill).

- As grab samples from the surface and from a decontaminated SPT sampler during the drilling of boreholes at approximately 0.5 m and 1.5 m bgl.

8.2.2 Asbestos Investigation

For the asbestos investigation, sampling intervals were as follows:

- 10 litres of representative material excavated from test pits was collected from both 0.0 – 1.0 m and 1.0 – 2.0 m depth ranges where fill material was observed. The 10 litre samples were spread out on black plastic sheeting, raked and inspected for potential ACM

- Where potential ACM was identified within the 10 litre samples, all observable potential ACM was collected and weighed.

- Where no potential ACM was identified in the 10 litre samples, a 500 ml sample was collected from material within the top 300 mm of the test pit.

8.3 Method of Sample Collection

8.3.1 Soil Contamination Investigation

All soil samples at depth were collected directly from the excavator bucket, as grab samples from surface soils or as undisturbed samples from a decontaminated SPT sampler. Samples were transferred to sample containers by Jacobs field staff by hand using disposable nitrile gloves.

Care was taken to ensure that representative samples were obtained from the depth required and that the integrity was maintained, particularly when dealing with potentially volatile and semi-volatile components.

8.3.2 Asbestos Investigation

Potential ACM as fragments of fibre cement sheeting were observed in test pits A1-TP05 (at 0.3m and 0.4m), A1-TP08 (0.4m), A1-TP09 (0.2m and 0.4m), A1-TP11 (0.3m and 0.4m), A1-TP12 (0.4m), A1-TP14 (0.2m) and A1-TP15 (0.2m) excavated for the asbestos investigation. The potential ACM identified was collected for identification and bulk samples were collected as grab samples from material representing the top 300 mm of soil observed at the respective test pit locations.

8.4 Sample Containers, Method of Sample Storage and Handling

All soil samples for the soil investigation were placed in jars provided by the primary laboratory Eurofins MGT (Eurofins). All sample jars were fitted with Teflon lined lids. Zip lock bags were used to contain the bulk samples collected as part of the asbestos investigation. The jars and zip lock bags were completely filled with soil, labelled with the date, unique sampling point identification and sampler information.

The soil jars and zip lock bags once filled with sample and sealed, were immediately placed in an esky/cool box in which a cooling medium had been added to keep the samples below a temperature of approximately 4 ^{o}C. At the end of the sampling program the samples in the cool box were transported to the laboratory. Custody seals were placed on the esky / cool box for delivery to the laboratory.

8.5 Decontamination Procedures

Samples from test pits and surface samples were collected as grab samples from material at the centre of the excavator bucket or directly from the surface of the site using new disposable nitrile gloves, changed between sample locations.

Samples from boreholes were collected from a decontaminated SPT sampler using new disposable nitrile gloves, changed between sample locations. The SPT sampler was decontaminated between sample locations by washing in potable water and then rinsed in potable water.

8.6 Sample Logging and Documentation

Experienced Jacobs field staff completed soil logs during the field investigation. The logs recorded the following data:

- Sample number and depth
- Soil classification, colour, consistency or density, moisture content and obvious indications of contamination
- Depth of excavation
- Excavation refusal
- Method of excavation.

In addition, the physical attributes of samples such as soil/fill characteristics, obvious signs of contamination such as discolouration and/or odour were noted on the logs.

All samples, including QA samples, were transported to the primary laboratory under Chain-of-Custody (CoC) procedures and maintained in an ice-filled cool box. The CoC detailed the following information:

- Site identification
- The sampler
- Nature of the sample
- Collection time and date
- Analyses to be performed
- Sample preservation method.

8.7 Laboratory Analysis

Soil samples were selected for analysis based generally on providing vertical and lateral coverage of the site and on visual observations.

8.7.1 Soil Contamination Investigation

Soil samples were analysed for the following potential contaminants of concern:

- 32 samples (26 primary + 6 QA/QC) for heavy metals, Total Recoverable Hydrocarbons (TRH), monocyclic aromatic hydrocarbons (BTEX), polycyclic aromatic hydrocarbons (PAH)
- 15 samples for heavy metals, TRH, BTEX, PAH, organochlorine pesticides (OCP) and polychlorinated biphenyls (PCB).
- 15 samples for perfluorinated compounds (PFOS, PFOA and 6:2 FTS)
- One sample for pH, cation exchange capacity (CEC) and %clay
- Two trip spike/trip blank for BTEX.

8.7.2 Asbestos Investigation

Laboratory analysis for the asbestos investigation comprised the following:

- 10 samples of fibre cement sheeting fragments for asbestos identification
- 15 bulk soil/fill samples from the surface soils (0-300 mm) for ACM, AF and FA.

8.8 Analytical Parameters and Methods

Jacobs commissioned Eurofins MGT (Eurofins) as the primary laboratory and Australian Laboratory Services (ALS) as the secondary laboratory. Both Eurofins and ALS are NATA accredited for the testing undertaken.

Where appropriate, the soil samples were analysed in accordance with NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013* (NEPC, 2013) guidelines using methods based on US Environment Protection Agency (US EPA) and American Public Health Association (APHA) approved analytical methods.

Asbestos identification was undertaken in accordance with the analytical methods detailed in the WADOH (2009) guidelines.

9 Fieldwork - Groundwater Investigation

Three groundwater wells (A1-GW1, A1-GW2 and A1-GW3) were installed to assess groundwater quality beneath and migrating onto the site and to identify any potential impacts to environmental receptors and beneficial groundwater users from the migration of contaminated groundwater (if present) onto and from the site. The groundwater investigation comprised:

- Construction of groundwater wells using new, Class 18, 50 mm UPVC with machine slotted screen sections, natural sand pack, bentonite seal and grout/bentonite to the surface. The wells were completed flush with the ground level with a gatic cover.

- Survey of the groundwater wells to site datum to allow for the calculation of groundwater gradients.

- Measuring of water levels within all wells to assess depth to groundwater.

- Development, purging and sampling of all newly installed groundwater wells.

Sampling locations and the proposed development footprint are presented in **Figure 2-1**.

9.1 Well Development and Sample Collection

Fieldwork was undertaken in accordance with documented Jacobs procedures by experienced staff. Groundwater wells were developed using a submersible pump.

Following development, the wells were allowed to stabilise for a minimum of 48 hours before being purged and sampled. The monitoring wells were purged prior to sampling in order to remove standing or stagnant water in the well and to ensure that samples collected were representative of the groundwater within the aquifer.

Monitoring wells were purged and sampled using a peristaltic pump. The pump had flow control to minimise drawdown and new dedicated, disposable polyethylene and silicon tubing was used for the collection of each sample. Care was taken to minimise the potential for volatile losses during sampling.

The electrodes of a calibrated water quality meter were used to measure pH, redox potential (Eh), electrical conductivity, dissolved oxygen and temperature in water purged from the wells. Samples were collected following stabilisation of these water quality parameters (generally ± 10%). A calibration certificate for the water quality meter is presented in **Appendix D.**

9.2 Decontamination Procedures

The submersible pump was decontaminated between groundwater well locations by washing in potable water and then rinsed in potable water.

Dedicated, single use sample tubing was used to purge and to sample all wells. All samples were collected using new disposable nitrile gloves, changed between sample locations.

9.3 Sample Containers

Laboratory supplied sample containers were used to contain the groundwater samples. Sample containers were filled in order of volatility, with samples for the most volatile substances collected first.

9.4 Method of Sample Collection, Storage and Handling

All sample containers were labelled with the sample number, project number, date obtained and sampler and site name. This information was repeated on the CoC form.

Sample containers were filled in order of the most volatile substances. Care was taken to minimise disturbance of the sample to avoid aeration by minimising the distance between the outlet tubing and the container and tilting the container so that discharge flowed gently down the inner walls. Samples for dissolved heavy metals in groundwater were field filtered using 0.45 micron single use stericups.

Once filled, the caps were checked to ensure that they were secure (and that there were no air bubbles/head space within the glass vials and bottles) then placed within an esky / cool box in which a cooling medium had been added to keep the samples below a temperature of approximately 4 ^{o}C. Custody seals were placed on the esky / cool box for delivery to the laboratory.

9.5 Sample Logging and Documentation

While on site, the Jacobs field staff completed sampling field data sheets which document (where applicable):

- Time of sample collection
- Weather
- Unique sample identification number
- Sample location and depth
- Static Water Level
- Water quality screening results (DO, Temperature, Redox potential, pH and conductivity)
- Presence or absence of odour (nature and intensity)
- Colour of the water
- Presence or absence of sediment in the well
- Well condition and purging volumes.

All samples, including QA samples, were transported to the primary laboratory under CoC procedures and maintained in an ice-filled cooler. The CoC detailed the following information:

- Site identification
- The sampler
- Nature of the sample
- Collection date of the sample
- Analyses to be performed

- Sample preservation method.

9.6 Laboratory Analysis – Water

Four (three primary and one QA/QC samples) groundwater samples were collected and analysed for dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), TRH, BTEX, PAH, PFOS, PFOA and 6:2 FTS.

9.7 Analytical Parameters and Methods

Jacobs commissioned Eurofins as the primary laboratory. Eurofins are NATA accredited for the analysis undertaken.

Where appropriate, the groundwater samples were analysed in accordance with NEPC (2013) using methods based on US EPA and APHA approved analytical methods.

10 Quality Control Plan

Field and laboratory QA/QC requirements compliant with NEPC (2013) requirements (where applicable) were undertaken as part of the field work program as outlined below.

10.1 Field QA/QC Programme

Field QA/QC for this project consisted of the collection of blind replicate, split replicate, trip blank and trip spike samples.

10.1.1 Environmental Samples

Environmental samples or field samples were the representative soil and groundwater samples collected for analysis to determine aspects of their chemical composition.

10.1.2 Blind Replicate Samples

Blind replicate samples were provided by the collection of two environmental samples from the same location. These samples were preserved, stored, transported, prepared and analysed in an identical manner. As a minimum, the results of analyses on the blind replicate sample pair were assessed by calculating the Relative Percentage Differences (RPDs) between the results. The RPD was calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeded the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Blind replicate samples were generally collected at a rate of one duplicate for every 20 environmental samples in accordance with AS 4482.1-2005.

10.1.3 Split Samples

Split samples provided a check on the analytical proficiency of the laboratories. Split samples were provided by the collection of two environmental samples from the same location. These samples were preserved, stored and transported in an identical manner. The spilt samples were analysed by the secondary laboratory. As a minimum, the results of analyses on the split replicate sample pair were assessed by calculating the RPDs between the results. The RPD was calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeded the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Split replicate samples were generally collected at a rate of one duplicate for every 20 environmental samples in accordance with AS 4482.1-2005.

10.1.4 Trip Blanks

The trip blanks consisted of laboratory-supplied purge water and clean sand. The purpose of trip blanks was to detect potential contamination during sample transport. These samples were kept within eskies during sampling activities and were not opened in the field. Trip blanks were analysed at the laboratory as regular samples for BTEX compounds only.

Trip blanks were submitted with every batch of soil and water samples delivered to the respective primary laboratories.

10.1.5 Laboratory-Prepared Trip Spike

Laboratory-prepared trip spikes consisted of purge water or sand spiked with known concentrations of BTEX. These samples were submitted for BTEX analysis with the results compared with the known additions. Generally, samples were spiked with concentrations of 15, 15, 15 and 30 ppm of benzene, toluene, ethylbenzene and total xylenes respectively. The purpose of these samples was to monitor VOC losses during transit.

Trip spikes were submitted with every batch of soil and water samples delivered to the respective primary laboratories.

10.2 Laboratory QA/QC Programme

The reliability of test results from the analytical laboratories was monitored according to the QA/QC procedures used by the NATA accredited laboratory. The QA/QC programme employed by Eurofins (the primary laboratory) specified holding times, extraction dates, method descriptions, Chain of Custody (COC) requirements, analysis, LORs and acceptance criteria for the results. Laboratory QA/QC requirements undertaken by Eurofins and ALS are based on NEPM requirements and are outlined below (NEPC, 2013).

10.2.1 Laboratory Duplicate Samples

Laboratory duplicates provided data on analytical precision for each batch of samples.

Laboratory duplicates were performed at a rate of one duplicate for batches of 8-10 samples with an additional duplicate for each subsequent ten samples.

10.2.2 Laboratory Control Samples

Laboratory control samples consisted of a clean matrix (de-ionised water or clean sand) spiked with a known concentration of the analyte being measured. These samples monitored method recovery in clean samples and were used (where required) to evaluate matrix interference by comparison with matrix spikes.

10.2.3 Surrogates

For organic analyses, a surrogate was added at the extraction stage in order to verify method effectiveness. The surrogate was then analysed with the batch of samples and percentage recovery calculated.

10.2.4 Matrix Spike

Matrix spikes consisted of samples spiked with a known concentration of the analyte being measured, in order to identify properties of the matrix that may hinder method effectiveness. Samples were spiked with concentrations equivalent to 5 to 10 times the LOR and percentage recovery calculated.

10.2.5 Method Blanks

Method blanks (de-ionised water or clear sand) were carried through all stages of sample preparation and analysis at a rate of approximately 10%. Analyte concentrations in blanks should be less than the stated LOR. Reagent blanks were run if the method blank exceeded the LOR. The purpose of method blanks was to detect laboratory contamination.

10.3 Data Acceptance Criteria

The QA/QC Data will be assessed against the Data Acceptance Criteria (DAC) provided in **Table 10.1.**

Table 10.1: QA/QC Compliance Assessment

QA/QC Sample Type	Method of Assessment	Acceptable Range
Field QA/QC		
Blind Replicates and Split Samples	The assessment of split replicate is undertaken by calculating the Relative Percent Difference (RPD) of the replicate concentration compared with the original sample concentration. The RPD is defined as: $\text{RPD} = 100 \text{ x } \frac{\mid X1 – X2 \mid}{\text{Average}}$ Where: X1 and X2 are the concentration of the original and replicate samples.	The acceptable range depends upon the levels detected: ▪ 0 – 100% RPD (When the average concentration is < 5 times the LOR) ▪ 0 – 75% RPD (When the average concentration is 5 to 10 times the LOR) ▪ 0 – 50% RPD (When the average concentration is > 10 times the LOR)
Blanks (Rinsate and Trip Blanks)	Each blank is analysed as per the original samples.	Analytical Result < LOR
Laboratory-prepared Trip Spike	The trip spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70% - 130%
Laboratory QA/QC		
Laboratory Duplicates	Assessment as per Blind Replicates and Split Samples.	The acceptable range depends upon the levels detected: ▪ 0 – 100% RPD (When the average concentration is < 4 times the LOR) ▪ 0 – 50% RPD (When the average concentration is 4 to 10 times the LOR) ▪ 0 – 30% RPD (When the average concentration is > 10 times the LOR)
Surrogates Matrix Spikes Laboratory Control Samples	Assessment is undertaken by determining the percent recovery of the known spike or addition to the sample. $\% \text{ Recovery} = 100 \text{ x } \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; C = Calculated Concentration.	▪ 70% - 130% (General Analytes) ▪ 50% - 130% (Phenols) ▪ 60% - 130% (OP Pesticides)

QA/QC Sample Type	Method of Assessment	Acceptable Range
Method Blanks	Each blank is analysed as per the original samples.	Analytical Result < LOR
Note: LOR = Laboratory Level of Reporting (LOR) or the minimum detection limit for a particular analyte.		

11 Quality Assurance and Quality Control

For the purpose of assessing the quality of data presented in this report, Jacobs collected and analysed various Quality Control (QC) samples (blind duplicate and blind triplicate sample), trip spike and trip blank samples, while the laboratory completed their own internal QC. The current section of this report is focused on the presentation of the results of these QC samples, adherence to Quality Assurance (QA) systems and discussion of deviations, if any from the DAC.

11.1 Field Quality Assurance

All samples were collected by experienced Jacobs environmental scientists and engineers, under established Jacobs protocols. Adherence to Jacobs protocols by experienced field staff trained in sample collection and handling techniques ensures the quality and representativeness of the samples collected.

11.2 Field Quality Control

The following QC samples were collected for laboratory analysis.

- Blind Duplicate: A1-QC01 (duplicate of soil sample A1-TP19_0.0), A1-QC03 (duplicate of soil sample A1-TP16_0.0), A1-QC05 (duplicate of soil sample A1-TP13_0.4) and A1-QC07 (duplicate of water sample A1-GW1)

- Split Replicate: A1-QC02 (duplicate of soil sample A1-TP19_0.0), A1-QC04 (duplicate of soil sample A1-TP16_0.0) and A1-QC06 (duplicate of soil sample A1-TP13_0.4)

- Trip Spike sample for soil and water – TS160517-4 (soil), TS160517-5 (soil) and TS160614-15 (water).

- Trip Blank sample for soil and water – TB160517-4 (soil), TB160517-5 (soil) and TB160614-15 (water).

Four blind duplicate samples, three soil samples and one water sample were analysed to assess the quality control during the field sampling program. This equates to 7% blind duplicate soil analysis and 33% blind duplicate water analysis. This blind duplicate analysis exceeds and therefore conforms to the Australian Standard (AS 4482.1 - 2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* requirement of 5%.

The Relative Percentage Differences (RPDs) for all analytes for the blind duplicates taken during the soil sampling program conformed to the DAC with the exception of:

- Benzo(a)pyrene TEQ (lower bound) (RPD 105%) between primary soil sample A1-TP16_0.0 and blind duplicate A1-QC03

- PAHs (Sum of total) (178 % RPD) between primary soil sample A1-TP16_0.0 and blind duplicate A1-QC03.

- C29-C36 Fraction (106 % RPD) between primary soil sample A1-TP16_0.0 and blind duplicate A1-QC03.

- C10 - C36 (Sum of total) (130 % RPD) between primary soil sample A1-TP16_0.0 and blind duplicate A1-QC03

RPDs calculate the difference in magnitude between two samples and do not take into account the minor differences in actual concentrations. With respect to Benzo(a)pyrene TEQ (lower bound), PAHs (Sum of total), C29 – C36 Fraction and C10 – C36 (Sum of total) concentrations reported in samples A1-TP16_0.0 and A1-QC03 represent values significantly lower than the site assessment criteria (where applicable). The blind duplicate pair was collected from fill material. It is inherently difficult to obtain representative duplicate samples from heterogeneous fill materials especially when they cannot be homogenised because of potential loss of volatiles.

As a conservative approach Jacobs have assessed soil quality using the higher reported concentration for Benzo(a)pyrene TEQ (lower bound), PAHs (Sum of total), C29 – C36 Fraction and C10 – C36 (Sum of total) (primary sample). It is unlikely that the exceedances of the RPDs for Benzo(a)pyrene TEQ (lower bound), PAHs (Sum of total), C29 – C36 Fraction and C10 – C36 (Sum of total) will affect the overall usability of the data set. RPD results for soil are presented in **Table C**.

The RPDs for all analytes for the blind duplicate pair taken during the groundwater monitoring program conformed to the DAC. RPD results for groundwater are presented in **Table D**.

Three split replicate samples for soil were analysed to assess the quality control during the field sampling program. This equates to 7% split replicate soil analysis. This split replicate analysis exceeds and therefore conforms to the Australian Standard (AS 4482.1 - 2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* requirement of 5%.

The RPDs for all analytes for the split replicates taken during the soil sampling program conformed to the DAC with the exception of:

- Benzo(a)pyrene TEQ (lower bound) (RPD 105%) between primary soil sample A1-TP16_0.0 and split replicate A1-QC04

- C10 - C36 (Sum of total) (RPD 133%) between primary soil sample A1-TP16_0.0 and split replicate A1-QC04.

RPDs calculate the difference in magnitude between two samples and do not take into account the minor differences in actual concentrations. The split replicate pair were collected from fill material. It is inherently difficult to obtain representative duplicate samples from heterogenous fill materials especially when they cannot be homogenised because of potential loss of volatiles.

As a conservative approach Jacobs have assessed soil quality using the higher reported concentration for Benzo(a)pyrene TEQ (lower bound) and C10 – C36 (Sum of total) (primary sample). It is unlikely that the exceedances of the RPDs for Benzo(a)pyrene TEQ (lower bound) and C10 – C36 (Sum of total) will affect the overall usability of the data set. RPD results for soil are presented in **Table C**.

A split replicate for the water samples was not collected due to the small number of samples collected for laboratory analysis. In consideration of the low number of water samples collected, that all samples were collected by experienced personnel in accordance with documented procedures and that all other blind duplicate analysis and split replicate analysis (soils only) indicate useable data sets, the non-collection of a split replicate water sample is unlikely to affect the usability of the data.

One trip spike was submitted with each batch of soil and water samples delivered to the laboratory. The trip spike samples were analysed for BTEX only. The trip spikes for soil and water returned concentrations of BTEX within the acceptable range (70% - 130%) as outlined in the DAC.

One trip blank was submitted with each batch of soil and water samples delivered to the laboratory for analysis of BTEX. The concentrations of BTEX compounds in the trip blank samples were below the respective laboratory LORs and therefore conformed to the DAC.

11.3 Laboratory QA

All analysis was undertaken by a NATA accredited laboratory using NATA accredited analytical methods.

11.4 Laboratory QC

Laboratory QC data is presented in full in the laboratory certificates in **Appendix E**.

11.4.1 Laboratory Duplicates

RPDs for all laboratory duplicates for soil samples conformed to the DAC with the exception of:

- Lead, RPD 44% (502324)
- Lead, RPD 36% (502800)

The laboratory (Eurofins) applied the NEPM 2013 acceptance criteria of 0 – 30% for laboratory duplicate sample recoveries. Laboratory duplicate sample recoveries for Lead in Eurofins batch 502800 while not conforming to the NEPM 2013 acceptance criteria did conform to the laboratories (Eurofins) own laboratory acceptance criteria of no limit for when the results are < 10 times the LOR and also conformed to the Jacobs DAC of 0 – 100% when the average concentration is < 4 times the LOR. Considering that the laboratory duplicate sample recovery complied with Eurofins NATA accredited acceptance criteria and the Jacobs DAC, the recovery outlying the applied NEPM criteria are considered unlikely to affect the usability of the data set.

The laboratory duplicate sample recovery for Lead in Eurofins batch 502324 while not conforming to the NEPM 2013 acceptance criteria did conform to the laboratories (Eurofins) own laboratory acceptance criteria of no limit for when the results are < 10 times the LOR and also conformed to the Jacobs DAC of 0 – 50% when the average concentration is 4 to 10 times the LOR. Considering that the laboratory duplicate sample recovery complied with Eurofins NATA accredited acceptance criteria and the Jacobs DAC, the recovery outlying the applied NEPM criteria are considered unlikely to affect the usability of the data set.

RPDs for all laboratory duplicates for water samples conformed to the DAC.

11.4.2 Laboratory Control Samples

Recoveries for all laboratory control samples for soil and water conformed to the DAC.

11.4.3 Surrogates

Recoveries for all laboratory surrogate samples for soil conformed to the DAC with exception of:

- Dibutylchlorendate, Surrogate Recovery 65% for sample A1-TP01_0.0

- Dibutylchlorendate, Surrogate Recovery 67% for sample A1-TP02_0.0
- 13C-PFHxA, Surrogate Recovery 61% for sample A1-TP05_0.0
- 13C8-PFOS, Surrogate Recovery 69% for sample A1-TP06_0.0
- Dibutylchlorendate, Surrogate Recovery 62% for sample A1-TP07_0.0
- Dibutylchlorendate, Surrogate Recovery 65% for sample A1-TP10_0.0
- Dibutylchlorendate, Surrogate Recovery 59% for sample A1-TP11_0.0
- Dibutylchlorendate, Surrogate Recovery 63% for sample A1-TP12_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 51% for sample A1-TP13_0.4
- Dibutylchlorendate, Surrogate Recovery 66% for sample A1-TP14_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 53% for sample A1-TP16_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 50% for sample A1-TP16_1.0
- Dibutylchlorendate, Surrogate Recovery 144% for sample A1-TP016_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 51% for sample A1-TP19_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 54% for sample A1-TP20_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 58% for sample A1-TP20_2.0
- Tetrachloro-m-xylene, Surrogate Recovery 132% for sample A1-TP20_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 52% for sample A1-QC01
- 4-Bromofluorobenzene, Surrogate Recovery 69% for sample A1-QC03
- 4-Bromofluorobenzene, Surrogate Recovery 67% for sample A1-QC05

The laboratory surrogate sample recoveries for Dibutylchlorendate in eight samples (A1-TP01_0.0, A1-TP02_0.0, A1-TP07_0.0, A1-TP10_0.0, A1-TP11_0.0, A1-TP12_0.0, A1-TP14_0.0 and A1-TP016_0.0), Tetrachloro-m-xylene in one sample (A1-TP20_0.0) and 4-Bromofluorobenzene in nine samples (A1-TP13_0.4, A1-TP16_0.0, A1-TP16_1.0, A1-TP19_0.0, A1-TP20_0.0, A1-TP20_2.0, A1-QC01, A1-QC03 and A1-QC05) while not conforming to the Jacobs DAC of 70 – 130% for general analytes did conform to the laboratories (Eurofins) own laboratory acceptance criteria of 50 – 150% for general analytes. Considering that the laboratory surrogate sample recoveries complied with Eurofins NATA accredited acceptance criteria and were only marginally above or below the Jacobs DAC limits the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

The laboratory surrogate sample recoveries 13C-PFHxA in one sample (A1-TP05_0.0) and 13C8-PFOS in one sample (A1-TP06_0.0) while not conforming to the Jacobs DAC of 70 – 130% for general analytes did conform to the laboratories (Eurofins) own laboratory acceptance criteria of 20 – 130% for PFAS. Considering that the laboratory surrogate sample recoveries complied with Eurofins NATA accredited acceptance criteria and were only marginally below the Jacobs DAC limits, the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

Recoveries for all laboratory surrogate samples for water conformed to the DAC with the exception of:

- 13C8-PFOS, Surrogate Recovery 29% for sample A1-GW1
- 13C8-PFOS, Surrogate Recovery 24% for sample A1-GW2
- 13C8-PFOS, Surrogate Recovery 24% for sample A1-GW3
- 13C8-PFOS, Surrogate Recovery 27% for sample A3-QC07.

The laboratory surrogate sample recoveries for 13C8-PFOS in four samples (A1-GW1, A1-GW2, A1-GW3 and A1-QC07) while not conforming to the Jacobs DAC of 70 – 130% for general analytes did conform to the laboratories (Eurofins) own laboratory acceptance criteria of 20 – 130% for PFAS. Considering that the laboratory surrogate sample recoveries complied with Eurofins NATA accredited acceptance criteria, the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

11.4.4 Matrix Spikes

Recoveries for all matrix spike control samples for soil conformed to the DAC with the exception of:

- Pyrene, Spike Recovery 142%

The Matrix spike recovery for Pyrene while not conforming to the Jacobs DAC of 70-130% for general analytes did conform to the laboratory's (ALS's) own laboratory acceptance criteria of 52 – 148% for matrix spike samples for Pyrene. Considering that the recovery complied with ALS's NATA accredited acceptance criteria and were only marginally above the Jacobs DAC limits, the recovery outlying the Jacobs DAC is unlikely to affect the usability of the data set.

Matrix spike recoveries could not be determined for Zinc in ALS batch EM1606429 due to background levels greater than or equal to four times the spike level. Considering that all samples analysed for Zinc in the sample batch recorded concentrations either below the LOR or significantly below the adopted site assessment criteria the absence of matrix spike recoveries for Zinc in ALS batch EM1606429 is unlikely to affect the usability of the data set.

Recoveries for all matrix spike control samples for water conformed to the DAC.

11.4.5 Method Blanks

All method blanks for soil and water reported analyte concentrations below the laboratory LOR and therefore conformed to the DAC.

11.4.6 Sample Holding Times

All soil and water samples were extracted and analysed within the specified holding times.

11.4.7 Sample Condition

All samples were received by the analytical laboratories in correctly preserved and chilled containers with no reported breakages. The individual sample receipts are presented with the laboratory reports in **Appendix E**.

11.5 QA/QC Assessment

It is concluded that laboratory data are of acceptable quality and are considered useable in making conclusions and recommendations regarding the site.

12 Site Assessment Criteria

To address potential health and environmental impacts within the site, Jacobs compared the analytical test results against a set of health and ecological based soil investigation levels to be referred to as Site Assessment Criteria (SAC) considered to be appropriate for the proposed land use and main potential receptors of concern (i.e. airport and commercial/industrial guidelines, given the current and proposed land use and that any potential exposure times to possible contaminants during construction activities have been considered as short term).

That is, the SAC have been set at levels that provide confidence that contaminant concentrations below the SAC will not adversely affect human health or terrestrial/aquatic ecosystems.

The SAC developed for the investigation was derived (where applicable) from the following guidelines.

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as revised 2013) - *Schedule B1 Guideline on Investigation levels for Soil and Groundwater* (NEPC, 2013)
- Airports (Environment Protection) Regulations 1997 (the Airport Regulations)
- Western Australia Department of Health (May 2009) *Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA Guidelines)*
- GHD (June 2015) *Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework*
- National Health and Medical Research Council (2008) *Guidelines for Managing Risks in Recreational Waters* (NHMRC, 2008)
- enHealth (June 2016) *Guidance Statements on Pefluorinated Chemicals – Interim Values* (enHealth, 2016).

12.1 Aesthetics

Aesthetics on sites relates to the presence of observable odours, discoloration and erroneous wastes materials in soil which could possibly indicate contamination. Such olfactory evidence can point to how receptors can be impacted by vapours on and migrating from the site. Odour threshold for organic substances can be exceeded in off-site settings (through groundwater transmission of hydrocarbons) and whilst may not represent a direct health risk, could possibly prompt civil action. Aesthetics was continually assessed during the investigation and reported on the field logs (where present).

12.2 Ecological Investigation Levels

The site and surrounding areas comprise land used for airport purposes. As such ecological investigation levels (EILs) were considered for a commercial/industrial land use as part of this investigation.

EILs were generated using the NEPC (2013) – Volume 2 – Table 1B (1-7). For the Project, it has been assessed that the EILs will apply to contaminants within the top 2 metres of soil at the surface / ground level which corresponds to the root zone and habitation zone of many species. Additionally, typical background concentrations were required to be calculated in order to derive selected EILs. To generate the EILs for the investigation, Jacobs have used the methodology as described in **Appendix A** and summarised below.

EILs were generated for heavy metals, DDT and naphthalene. Sample A1_TP02_2.5 was assumed to be representative of the 'background concentration' for the soils within the site due to the sample being taken from natural soils, the depth of the sample (2.4 mbgl), and that the soil at this location was unlikely to be impacted by anthropogenic sources. The EILs were calculated (where appropriate) using the NEPC (2013) equation:

EIL = ABC[1] + ACL[2]

In context of the Airport Regulation for the protection of soil ecosystems, soil analytical results have also been compared against Table 2 – areas of environmental significance.

A summary of the adopted EILs is presented as **Table 12.1**.

Table 12.1: Ecological Investigation Levels (expressed as mg/kg).

Substance	Ecological Investigation Levels	Airport Regulations [4]
Arsenic	160 [1]	20
Cadmium	3 [2]	3
Chromium	670 [3]	50
Copper	198.7 [3]	60
Lead	1,810 [3]	300
Mercury	1 [2]	1
Nickel	295 [3]	60
Zinc	425 [3]	200
DDT	640 [1]	0.97
Naphthalene	370 [1]	-
Total PCB	-	1
Aldrin	-	0.05
Dieldrin	-	0.2

[1] Generic EILs for aged arsenic/DDT/Naphthalene from **Table 1B(5).**

[2] EILs from NEPM 1999 (no EILs specified for contaminants in NEPM 2013).

[3] EILs derived from NEPM 2013 equation ABC+ACL.

[4] Levels from the Airport Regulations Table 2 – areas of environmental significance

12.3 Ecological Screening Levels

Ecological Screening Levels (ESLs) are focused on petroleum hydrocarbon and total recoverable hydrocarbon (TRH) compounds and are compared against actual site conditions (sub-surface materials and depth) to assess the potential risk to terrestrial ecosystems. For the purposes of calculating the ESLs, the generic soil type (i.e. three broad classes of sands, silts or clays) and land use need to be defined.

For the purposes of this assessment Jacobs considered clays to be most representative for the soil profile at the site.

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[1] ABC is ambient background concentration (the soil concentration in a specified locality that is the sum of the naturally occurring background level and the contaminant levels that have been introduced from diffuse or non-point sources by general anthropogenic activity).

[2] ACL is added contaminant limit (the added concentration (above the ABC) of a contaminant above which further appropriate investigation and valuation of the impact on ecological values is required).

Given the current and ongoing land use of commercial/industrial, the corresponding land use and associated ESL were used to determine the assessment criteria.

In context of the Airport Regulation for the protection of soil ecosystems, soil analytical results for hydrocarbon compounds have also been compared against Table 2 – areas of environmental significance.

Table 12.2 summarises the ESL criteria for soils that have been adopted.

Table 12.2: ESLs for Petroleum Based Fractions (expressed as mg/kg).

Compound / Fraction	Ecological Screening Levels[1]	Airport Regulations [2]
F1 (C6 – C10)	215	-
F2 (>C10 – C16)	170	-
F3 (>C16 – C34)	2,500	-
F4 (>C34 – C40)	6,600	-
Benzene	95	0.5
Toluene	135	3
Ethylbenzene	185	5
Xylenes	95	5
Benzo(a)pyrene	0.7	-
TPH (C6 - C9)	-	100
TPH (>C6)	-	1,000
Total PAH	-	5

[1] Table 1B(6) ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)pyrene in soils - NEPM (2013).

[2] Levels from the Airport Regulations Table 2 – areas of environmental significance

12.4 Health Investigation Levels

To address potential health impacts at the site, Jacobs compared the analytical testing results against a set of health based Soil Investigation Levels (SILs) appropriate for commercial/industrial land use in context of the current and future land use as an airport and have taken into consideration the potential for contamination in soil to impact upon groundwater and generate vapours which could impact upon on human receptors. The health based SILs are a combination of Health Investigation Levels (HILs) and Health Screening Levels (HSLs) as detailed in the NEPM (2013) and the Accepted Limit/Trigger Levels detailed in Table 1 – areas of an airport generally of the Airport Regulations (1997). The adopted SILs are summarised in **Table 12.3**.

HILs have been developed for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of three metres below the surface for residential use.

HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physico-chemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to >4 metres. Further details on their use are provided in Friebel and Nadebaum (2011a, 2011b & 2011c).

The HSLs defined within the NEPC (2013) relate only to the volatile fractions of the petroleum hydrocarbons range i.e. BTEX, naphthalene and TRH C6 – C10, TRH C10 – C16.

Jacobs has adopted the lower value from the following criteria given that exposure times to contamination (if present) during construction are expected to be short term:

- NEPC (2013) Health Investigation Level recommended from exposure setting 'D' which includes premises such as shops, offices, factories and industrial sites (i.e. sites with minimal exposure opportunities).
- Friebel, E & Nadebaum, P (September 2011) Technical Report No.10, Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document - HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Worker (Table A4).

Table 12.3: Soil Investigation Levels (expressed mg/kg)

Contaminants	Soil investigation levels (HILs / HSLs)	
	Commercial / Industrial (D)	Airport Regulations
Metals/Metalloids		
Arsenic (total)	3,000 [1]	500
Cadmium	900 [1]	100
Chromium (III)	3,600 [1]	600,000
Copper	240,000 [1]	5,000
Lead	1,500 [1]	1,500
Mercury (inorganic)	730 [1]	75
Nickel	6,000 [1]	3,000
Zinc	400,000 [1]	35,000
Polycyclic Aromatic Hydrocarbons		
Carcinogenic PAHs (as B(a)P TEQ)	40 [1]	-
Naphthalene	11,000 [3]	-
B(a)P	-	5
Total PAHs	4,000 [1]	100
Total Recoverable Hydrocarbons		
TRH (C6-C9)	-	800
TRH (>C6)	-	5,000
>C16-C34	27,000 [3]	-
>C34-C40	38,000 [3]	-
Polychlorinated Biphenyls		
PCB	7 [1]	50
Organochlorine Pesticides		
DDT		1,000
DDD + DDE + DDT	3,600 [1]	-
Aldrin	-	50
Aldrin and dieldrin	45 [1]	20
Dieldrin	-	20
Chlordane	530 [1]	250

Contaminants	Soil investigation levels (HILs / HSLs)				
	Commercial / Industrial (D)				Airport Regulations
Endosulfan	2,000 [1]				-
Endrin	100 [1]				-
Heptachlor	50 [1]				50
HCB	80 [1]				-
Methoxychlor	2,500 [1]				-
Mirex	100 [1]				-
Toxaphene	160 [1]				-
F1, F2 and BTEX (Based on a CLAY Soil Type) [4, #]					
Depth (m)	0 – <1m	1 – <2m	2 – <4m	>4m	-
F1 (C6-C10*)	310	480	NL	NL	-
F2 (>C10-C16*)	20,000 [3]				-
Benzene	4	6	9	20	1
Toluene	99,000 [3]				130
Ethylbenzene	27,000 [3]				50
Xylenes	81,000 [3]				25

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct contact, Technical Report 10.

[4] NEPC (2013) Table 1A(3) Soil HSLs for Vapour Intrusion (mg/kg) HSL D Commercial / Industrial.

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

[#] Soil Vapour as the primary Exposure Pathway to impact potential receptors.

12.5 Management Limits

Within NEPC (2013), management limits are applied to petroleum hydrocarbons which are considered in addition to the SAC (HILs, EILs, ESLs etc). These Management Limits reflect the nature and properties of petroleum hydrocarbons and their potential effects such as:

- formation of observable light non-aqueous phase liquids (LNAPL)
- fire and explosive hazards
- effects on buried infrastructure e.g. penetration of, or damage to, in-ground services by hydrocarbons.

The application of the management limits will require site specific factors to be considered in more detail. These factors include, but not limited to, depth of building basements and services (where applicable) and depth to groundwater in order to determine the maximum depth to which the limits should apply. When the management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

The presence of site TRH contamination at the levels of the management limits does not imply that there is no need for administrative notification or controls in accordance with jurisdiction requirements. Adopted management limits for petroleum hydrocarbons are detailed in **Table 12.4**.

Table 12.4: Management Limits for TPH fractions F1–F4 in soil (adapted from NEPC 2013 Schedule B1)

TPH fraction	Soil texture	Management Limits[1] (mg/kg dry soil)
		Commercial and Industrial
F1[2] C_6- C_{10}	*Fine*	800
F2[2] >C_{10}-C_{16}	*Fine*	1,000
F3 >C_{16}-C_{34}	*Fine*	5,000
F4 >C_{34}-C_{40}	*Fine*	10,000

[1] Management limits are applied after consideration of relevant ESLs and HSLs

[2] Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

12.6 Asbestos

The NEPM (2013) adopts guidelines for asbestos materials in soil as outlined in the WADOH (2009) guidelines. The WADOH (2009) guidelines were designed specifically to improve the characterisation of asbestos soil contamination and to manage human health risks now and into the future and specifically take the following practical positions into account:

- That overall, potential health impacts posed by different asbestos minerals, such as chrysotile and crocidolite, and fibre dimensions can be treated as equivalent
- ACM may pose a future free-fibre risk through its degradation, and therefore potential release of asbestos fibres
- The cancer risk from asbestos should be kept as low as practical and preferably no more than one occurrence in one million over a lifetime for the exposed population. Mesothelioma is used here as the most sensitive health impact of asbestos exposure.

The WADOH (2009) guideline values are based on extensive research by Swartjes and Tromp in the Netherlands (2008). The study resulted in the Netherlands introducing general regulatory investigation criteria of 0.01% w/w asbestos for fibrous asbestos and 0.1% w/w asbestos for non-friable ACM. The 0.01% criteria has the highest attendant risk (ie. Residential use) and is set at a level that should keep asbestos air levels below 0.001 fibres/millilitre (f/ml) and probably around 0.0001 f/ml. Using WHO (2000) risk figures for mesothelioma, 0.0001 f/ml corresponds to a lifetime risk of 10^{-6} to 10^{-5} in the exposed human population, which are risks that are considered broadly acceptable to the WADOH.

WADOH has used these Netherland figures and divided by a factor of 10 to derive the investigation criteria outlined in the WA guidelines. The factor of 10 takes into account the greater dryness and dust-generating potential of local soil and the fact that WADOH treats the mineralogical forms of asbestos as equivalent. The fibrous asbestos criterion applies to Friable Asbestos (FA) and Asbestos Fines (AF) due to their ability to generate asbestos fibre. WADOH applies even higher criteria for ACM, depending on the site use. These mirror the NEPM (2013) site uses and associated default exposure ratios.

Soil asbestos investigation criteria are outlined in **Table 12.5**.

Table 12.5: Soil Asbestos Investigation Criteria

Site Asbestos Investigation Criteria	Site Use
0.001% w/w asbestos for FA and AF	All site uses
0.05 % w/w asbestos for ACM	Commercial/Industrial
All forms of asbestos	No visible asbestos in surface soil [1]

[1] Investigation criteria from NEPM (2013)

Taking into account the current and proposed future land use for the site, Jacobs have adopted the soil asbestos investigation criteria for all land uses (for FA and AF), commercial/Industrial land use for ACM and no visible asbestos in surface soils as the SAC.

12.7 Perflourinated Chemicals (PFCs)

The Commonwealth and State regulatory framework for the management of PFC impacts to land is still under development. There are no screening criteria for PFCs for soil included in the NEPC (2013). There are no specific published NSW EPA guidelines or requirements for the assessment of PFC impacts or for the disposal of PFC impacted waste in NSW.

Jacobs has adopted SAC for PFCs and management approaches from the GHD (2015) guidelines relevant to a commercial/industrial land use.

The screening criteria relevant for this investigation are summarised in **Table 12.6** below.

Table 12.6: Selected Interim Screening Criteria for PFC

Exposure scenario	PFOS	PFOA	6:2FTS
Soil, human health – industrial	90 mg/kg	240 mg/kg	900 mg/kg
Ecological (terrestrial)	4.71 mg/kg (commercial/industrial – 60% species protection)	3.73 mg/kg	NA

12.8 Groundwater

Groundwater investigation levels (GILs) are the concentrations of a contaminant in groundwater above which further investigation (point of extraction) or a response (point of use) is required. GILs are based on Australian water quality guidelines and drinking water guidelines and are applicable for assessing human health risk and ecological risk from direct contact (including consumption) with groundwater.

The NSW EPA has endorsed the use of the water quality trigger levels given in the Australia and New Zealand Environment and Conservation Council (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ANZECC 2000) guidelines. These guidelines provide criteria for the protection of aquatic ecosystems (marine and fresh waters), primary industries, recreational water and drinking water.

The most likely environmental receptor of groundwater from the site would be the marine ecosystems of the Georges River located approximately 1 km to the west of the site. Based on information from the NSW Department of Environment, Climate Change and Water *NSW Water Quality and River Flow Objectives* (NSW DECCW, 2006) the Georges River is an estuarine environment down stream of Liverpool.

The NSW DECCW (2006) defines water quality objectives (WQO) for the Georges River. The areas surrounding the Georges River in the near vicinity of the site are characterised by urban developments. The NSW DECCW (2006) states that the WQO for the Georges River affected by urban development should be selected to protect aquatic ecosystems and recreational contact (both primary and secondary). It is noted in NSW DECCW (2006) that these WQOs may not be achievable in the short term and that the protection of primary recreational users may not be achievable.

From a review of the NSW Department of Primary Industries – Water Real Time Data database, no registered groundwater bores are located within a 0.5 km radius of the site. Based on the information above and the absence of known registered sensitive beneficial users of the groundwater down gradient from the site, the site assessment criteria (SAC) for groundwater should consider protection of environmental receptors. The most appropriate Groundwater Investigation Levels (GIL) are generally the 95% protection levels for marine water given in the ANZECC (2000) guidelines, although these are likely to be conservative in urbanised areas where waterways are degraded. Where the guideline does not provide these criteria or the guideline considers the 95% protection level is inappropriate, GILs have been sourced by using:

- The 99% protection levels for marine water ecosystems given in the ANZECC (2000) guidelines for contaminants considered to be bioaccumulative (e.g. cadmium, mercury, nickel)

- The 99% and 95% protection levels for freshwater ecosystems provided in the ANZECC (2000) guidelines (where applicable/available)

- NEPC (2013) prescribed GILs

- With respect to toluene and ethyl benzene the NSW EPA (1994) threshold concentrations for the protection of aquatic ecosystems.

- Nation Health and Medical Research Council (2011) *Australian Drinking Water Guidelines* (NHMRC, 2011)

- The Dutch (2000) groundwater intervention levels for Total Petroleum Hydrocarbons fractions. The aromatic solvents criteria of 150µg/L was adopted for TRH (C6-C9) fraction and the mineral oil criteria of 600µg/L was adopted for TPH (C10-C36) fraction.

Depth to groundwater measured during the monitoring was between 2.443 m and 3.303 m bgl. For the purposes of this assessment Jacobs have based the GILs and groundwater health screening levels (HSLs) on a depth of between 2 and 4 m (shallowest groundwater depth range provided in NEPC (2013).

In addition schedule 2 (Water pollution – accepted limits) of the Airports (Environment Protection) Regulations 1997 outline the accepted limit of concentrations of contaminants for freshwater and marine water. The adopted GILs are summarised in **Table 12.7**.

Table 12.7: Groundwater Investigation Levels (expressed as µg/L)

Contaminants	Contaminant	Ecosystem protection levels – Marine	Airport Regulations
Heavy Metals	Arsenic	24 [3]	50
	Cadmium	0.7 [2]	2.0
	Chromium	4.4 [1]	50
	Copper	1.3 [1]	5.0
	Lead	4.4 [1]	5.0
	Mercury	0.1 [2]	0.1
	Nickel	7 [2]	15
	Zinc	15 [1]	50
BTEX Compounds	Benzene	500 [2]	300
	Ethyl Benzene	140 [4]	-
	Naphthalene	50 [2]	-
	Toluene	300 [4]	-
	Xylene (o)	350 [3]	-
	Xylene Total	380 [4]	-
Total Petroleum Hydrocarbons (TRH)	TRH C_6-C_9	150 [5]	-
	TRH C_{10}-C_{36}	600 [5]	-
Polycyclic Aromatic Hydrocarbons (PAHs)	Benzo(a)pyrene	0.01 [6]	-
	Naphthalene	50 [2]	-

Notes:
[1] ANZECC (2000) 95% of species protected – marine
[2] ANZECC (2000) 99% of species protected –marine
[3] ANZECC (2000) 95% of species protected – fresh water
[4] NSW EPA (1994) Protection of aquatic ecosystems - fresh water
[5] Dutch (2000) groundwater intervention levels
[6] NHMRC 2011 Australian Drinking Water Guidelines

HSLs for groundwater apply to exposure to petroleum hydrocarbons through the dominant vapour inhalation exposure pathway only.

The groundwater HSLs are based on three-phase equilibrium theory and vapour is limited by the maximum solubility limit of the chemical in the soil pore water phase or the groundwater. The soil saturation concentration of a particular contaminant is the condition where pore water is at its solubility limit and soil vapour is at the maximum vapour concentration. When a calculated HSL in groundwater exceeds this limit, the vapour in the soil or above groundwater cannot result in an unacceptable vapour risk and is denoted as NL (not limiting) in the HSL tables (Tables 1 A(3) – 1A(5)). HSLs for groundwater have been developed for sand, silt and clay soils based on the US soil texture classification system (Friebel & Nadebaum 2011a). The HSLs assume a uniform soil profile and the soil texture making up the greatest proportion of the soil profile should be used in selecting the appropriate HSLs (Friebel & Nadebaum 2011a and 2011b). Based on observations during the drilling and soil sampling program undertaken at the site, clay has been selected as the major soil type underlying the site.

The heavier end fractions, >C_{16}-C_{34} and >C_{34}-C_{40} are not volatile and as such are not included within the groundwater HSLs for vapour intrusion.

The adopted criteria for vapour intrusion relevant for this investigation are summarised in **Table 12.8** below.

Table 12.8: Groundwater HSLs for vapour intrusion (mg/L)

Contaminants	**Groundwater investigation levels (HILs / HSLs)**
	Commercial / Industrial (D)
F1, F2 and BTEX (*Based on a CLAY Soil Type*) [1,]	
Depth (m)	*2 – <4*
F1 (TRH C_6-C_{10})	NL
F2 (TRH >C_{10}-C_{16})	NL
Benzene	30,000
Toluene	NL
Ethylbenzene	NL
Xylenes	NL
Naphthalene	NL

1 NEPC (2013) Table 1 A(4) Groundwater HSLs for vapour intrusion –Commercial / Industrial, 2 to <4m, CLAY.

Soil Vapour as the primary Exposure Pathway to impact potential receptors

NL – No Limit: No limit exists for these contaminants based on the function of the solubility limit, the soil vapour and groundwater.

At the request of BAL, the significance of PFC in groundwater have been assessed against the GHD (June 2015) *Managing PFC Contamination at Airports, Interim Contamination Management Strategy and Decision Framework* prepared for Airservices Australia (GHD, 2015).

It should be noted that the guidelines for PFC in groundwater detailed in the GHD (2015) report are for the protection of groundwater as a potable water resource. At the time of preparing this report, there were no licensed potable users of groundwater within and/or immediately surrounding the Bankstown Airport site.

The adopted criteria for PFC compounds in groundwater are summarised in **Table 12.9**.

Table 12.9: Groundwater Investigation Levels (expressed as µg/L)

Contaminants	**Drinking Water**
8:2 Fluorotelomer sulfonate	0.4
6:2 Fluorotelomer Sulfonate (6:2 FtS)	5.0
PFOS	0.2
PFOA	0.4

13 Results

13.1 Site Stratigraphy

The sub-surface material encountered in the test pits (A1-TP01 to A1-TP20) and boreholes (A1-BH01 to A1-BH10 and A1-GW1 to A1-GW3) generally consisted of fill material comprising predominantly silty clay and minor gravelly clays and silty sands to a maximum depth of 1.2 m bgl overlying alluvial silty clays with occasional ferruginous gravel layers to a maximum depth of 9.95 m bgl. The deepest fill (approximately 0.7 m in thickness) was generally observed within the north western portion of the site.

13.2 Groundwater Flow Gradients

The heights (surveyed to site datum using a laser level) for all newly installed groundwater wells were surveyed to allow for the calculation of groundwater flow gradients. The position and heights (relative to site datum) of the groundwater wells and reduced groundwater levels are contained in **Table 13.2.**

Table 13.2: Groundwater Well Level Information

Well ID	Groundwater Level (m BTOC)	Relative Height (m TOC)	Relative Level of Groundwater (m)
A1_GW1	2.850	2.2197	5.0697
A1-GW2	3.303	1.099	4.402
A1-GW3	2.443	0.910	3.353

Notes:

- m BTOC – m below top of casing
- m TOC – m top of casing
- Relative level of groundwater reported as metres below site datum
- Groundwater levels as measured 20.06.16

The survey and groundwater level measurement indicated that groundwater flow direction is in a general south easterly direction away from the Georges River. It may be possible that the significant rainfall event experienced at the site and subsequent flooding of the Georges River in the vicinity of the site prior to undertaking the groundwater monitoring influenced localised groundwater levels across the site. The flooding of the Georges River is likely to have created groundwater mounding in the vicinity of the river which would push groundwater away from the river. When river levels have stabilised, groundwater flow direction is likely to return to back towards the Georges River.

13.3 Aesthetics

A number of aesthetic issues (i.e. presence of erroneous wastes) were observed during the fieldwork program as detailed in **Table 13.1**

Table 13.1: Aesthetic Issues

Investigation Location	Depth (mbgl)	Aesthetic Issues
A1-BH08	0.3-0.7	Minor black vitreous material
A1-TP04	0-0.1	Minor lead shot
A1-TP05	0.3	Three fragments of fibre cement sheeting (potential ACM)
A1-TP05	0.4	Three fragments of fibre cement sheeting (potential ACM). Piece of ceramic pipe
A1-TP06	0-0.1	Trace lead shot

A1-TP07	0-0.2	Trace lead shot. Sandstone and aggregate inclusions
A1-TP08	0-0.2	Trace lead shot
A1-TP08	0.2-0.7	Brick, concrete, asphalt, ceramic pipe inclusions
A1-TP08	0.4	Two fragments of fibre cement sheeting (potential ACM)
A1-TP09	0-0.1	Sandstone inclusions
A1-TP09	0.1-0.6	Brick, concrete, sandstone inclusions
A1-TP09	0.2	Two fragments of fibre cement sheeting (potential ACM)
A1-TP09	0.4	Three fragments of fibre cement sheeting (potential ACM)
A1-TP11	0-0.2	Sandstone and aggregate inclusions
A1-TP11	0.2-0.6	Aggregate, asphalt, concrete, sandstone, brick, wood inclusions
A1-TP11	0.3	One fragment of fibre cement sheeting (potential ACM)
A1-TP11	0.4	One fragment of fibre cement sheeting (potential ACM)
A1-TP12	0-0.4	Asphalt, ceramic pipe, sandstone inclusions
A1-TP12	0.4	One fragment of fibre cement sheeting (potential ACM)
A1-TP14	0-0.3	Concrete, brick inclusions
A1-TP14	0.2	Two fragments of fibre cement sheeting (potential ACM)
A1-TP15	0-0.3	Ceramic pipe, sandstone inclusions
A1-TP15	0.2	One fragment of fibre cement sheeting (potential ACM)
A1-TP15	0.3-0.7	Sandstone, asphalt, concrete, steel pipe inclusions
A1-TP16	0-0.8	Sandstone, asphalt, brick, concrete inclusions
A1-TP20	0.3-0.8	Sandstone inclusions

Borehole and test pit logs are presented in **Appendix B**.

Although not observed at the specific sampling locations, isolated areas of lead shot were observed across the surface of the north eastern portion of the site (between the drainage swale and the taxiways).

Lead shot was observed at a number of the sample locations and this material was sampled accordingly. In other areas (as detailed above), the contamination status has been extrapolated based on observations and sample results for lead shot impacted materials.

13.4 Soil Analytical Results

Soil analytical results from samples collected from test pits (A1-TP01 to A1-TP20) and boreholes (A1-BH01 to A1-BH10) are presented below and in **Table A**. Laboratory certificates of analysis are presented in **Appendix E**.

13.4.1 Heavy Metals

Concentrations of all heavy metals in all soil samples analysed were below the SAC with the exception of the following:

- Lead concentrations (1,000 mg/kg) detected in sample A1_TP03_0.0 exceeded the EIL (300 mg/kg)
- Lead concentrations (7,400 mg/kg) detected in sample A1_TP04_0.0 which exceed the both the EIL (1,810/300 mg/kg) and HIL (1,500 mg/kg)
- Lead concentrations (330 mg/kg) detected in sample A1_TP06_0.0 exceeded the EIL (300 mg/kg)

- Cadmium concentrations (6.2 mg/kg) detected in sample A1_TP13_0.0 exceeded the EIL (3 mg/kg).

13.4.2 Total Recoverable Hydrocarbons (TRH)

The concentrations of TRH compounds in all soil samples analysed were below the SAC.

13.4.3 BTEX

The concentrations of BTEX compounds in all soil samples analysed were below the LOR and below the SAC.

13.4.4 Polycyclic Aromatic Hydrocarbons (PAHs)

Concentrations of all PAH compounds in all soil samples were below the SAC with the exception of concentrations in sample A1_TP16_0.0 as detailed below:

- Benzo(a)pyrene concentrations (1.2 mg/kg) exceeded the ESL (0.7mg/kg)
- Total PAH concentrations (8.7 mg/kg) exceeded the ESL of (5 mg/kg).

13.4.5 Organochlorine Pesticides (OCPs)

The concentrations of OCP compounds in all soil samples analysed were below the LOR and below the SAC.

13.4.6 Polychlorinated Biphenyls (PCB)

The concentrations of PCB compounds in all soil samples analysed were below the LOR and below the SAC.

4.1.1 Perfluorinated Compounds (PFC)

The concentrations of PFC compounds in all soil samples analysed were below the SAC with the exception of PFOS concentrations (5.7 mg/kg) detected in sample A1_TP07_0.0 which exceeded the EIL for commercial/industrial land use.

Sample locations exceeding the respective SAC are presented in **Figure 3-1.**

13.5 Asbestos Analytical Results

Soil analytical results from samples collected from 15 test pit locations (A1-TP01, A1-TP02, A1-TP04, A1-TP05, A1-TP06, A1-TP07, A1-TP08, A1-TP09, A1-TP11, A1-TP12, A1-TP13, A1-TP14, A1-TP16, A1-TP18 and A1-TP19) are presented below and in **Table A.** Laboratory certificates of analysis are presented in **Appendix E**.

13.5.1 Asbestos Analysis of Soil Bulk Samples

Asbestos analytical results for the soil bulk samples are presented below and in **Table A**. Laboratory certificates of analysis are presented in **Appendix E.**

Trace analysis of asbestos in all soil bulk samples analysed reported no detectable asbestos. Analysis for AF, FA and ACM for all samples analysed recorded results of no visible asbestos identified. Laboratory calculated concentrations for ACM, AF and FA and total asbestos in soil reported results below the laboratory limits of reporting (LOR).

13.5.2 Asbestos Concentration in Soil

Asbestos (based on visual observations during the fieldwork and laboratory identification) was identified in fragments of fibre cement sheet sampled from A1-TP05 (at 0.3 m and 0.4 m), A1-TP08 (at 0.4 m), A1-TP09 (at 0.2 m and 0.4 m), A1-TP11 (at 0.3 m and 0.4 m), A1-TP12 (at 0.4 m), A1-TP14 (at 0.2 m) and A1-TP15 (0.2 m).

Potential ACM was not observed and sampled from 0.0 – 1.0 m (strata A) in the remaining test pits.

Sample locations exceeding the respective SAC are presented in **Figure 3-1.**

13.5.3 Inspection and Analysis of Surface Soils

A visual inspection of surface soils for potential ACM fragments was undertaken at each of the 20 test pit locations (where possible) prior to the commencement of excavations. Where the surface of the site and surface soils were visible, no potential ACM fragments were observed at or in the near vicinity of the sampling locations.

13.6 Groundwater Analytical Results

Groundwater analytical results from samples collected from groundwater wells A1-GW1, A1-GW2 and A1-GW3 are presented below and in **Table B**. Laboratory certificates of analysis are presented in **Appendix E**.

13.6.1 General Water Quality Parameters

The general water quality parameters measured at the respective groundwater well locations indicated the following:

- pH ranged from 5.15 pH units (A1-GW3) to 6.70 pH units (A1-GW2)
- Electrical conductivity ranged from 16,232 µS/cm (A1-GW1) to 24,118 µS/cm (A1-GW3)
- Temperature ranged from 18.0 °C (A1-GW2) to 19.1 °C (A1-GW1)
- Dissolved oxygen levels ranged from 2.57 mg/L (A1-GW3) to 4.28 mg/L (A1-GW2)
- Redox potential ranged from 171.9 mV in A1-GW1 to 376.8 mV in A1-GW2.

Groundwater field data sheets are provided in **Appendix C**.

Field water quality parameters indicated that groundwater beneath the site was slightly acidic. The EC of the groundwater beneath the site was generally brackish to saline. ORP measurements were generally consistent across the site and indicated a minor oxidizing potential.

13.6.2 Heavy Metals

Concentrations of all dissolved heavy metals in all samples were low or below the LOR and below the SAC with the following exceptions:

- Mercury concentrations exceeded the SAC of 0.1 µg/L in the groundwater sample analysed from A1-GW2 (0.2 µg/L)

- Nickel concentrations exceeded the SAC of 7 µg/L and the airport regulations of 15 µg/L in groundwater samples analysed from A1-GW3 (62 µg/L)

- Zinc concentrations exceeded the SAC of 15 µg/L and the airport regulations of 50 µg/L in groundwater samples analysed from A1-GW3 (57 µg/L).

13.6.3 BTEX

Concentrations of all BTEX compounds in all samples analysed were below the LOR and below the SAC.

13.6.4 Total Recoverable Hydrocarbons (TRH)

Concentrations of all TRH compounds in all samples analysed were below the SAC.

13.6.5 Polycyclic Aromatic Hydrocarbons (PAHs)

Concentrations of all PAH compounds in all samples analysed were equal to or below the LOR and below the SAC.

13.6.6 Perfluorinated Compounds (PFCs)

Concentrations of all PFC compounds in all samples analysed were below the SAC.

14 Discussion

14.1 Soil

Samples of soil / fill material collected from the test pits were analysed for contaminants of concern which could be associated with the former and current use of the site for airport purposes.

The following aesthetic issues were identified at the site:

- Lead shot was observed in surface soils at test pits A1-TP04, A1-TP06, A1-TP07 and A1-TP08 located in the eastern portion of the site. Isolated areas of lead shot were also observed across the surface of the eastern portion of the site (between the drainage swale and the taxiways).

- Potential ACM (later confirmed ACM by laboratory identification) was observed in fill material at depth (i.e. below the surface of the site) in test pits A1-TP05, A1-TP08, A1-TP09, A1-TP11, A1-TP12, A1-TP14 and A1-TP15 located within the central portion of the site.

- Miscellaneous materials (i.e. sandstone and general building wastes) were observed in A1-BH08, A1-TP05, A1-TP07, A1-TP08, A1-TP09, A1-TP11, A1-TP12, A1-TP14, A1-TP15, A1-TP16 and A1-TP20 located across the western and central portions of the site.

No aesthetically unsuitable materials were observed in the natural soils underlying the fill material at the site.

Soil samples from test pits and boreholes were selected for analysis based generally on providing vertical and lateral coverage of potential contaminant extents and on visual observations. The majority of soil samples recorded contaminant concentrations below the adopted SAC. A small number of samples reported concentrations of contaminant compounds above adopted ecological investigation and screening levels. In context of the likely development at the site (comprising commercial/industrial facilities with minimal landscaping opportunities), these exceedances are unlikely to impact upon the development or continued use of the site for airport related activities.

A sample collected from surface soils at test pit location A1-TP04 reported lead concentrations of 7,400 mg/kg. The concentration detected is almost five times the health investigation levels of 1,500 mg/kg. When considering results in context of investigation levels, the NEPC (2013) guidelines state that in context of localised elevated values (hotspots), the results should meet the following criteria:

- The standard deviation of the results should be less than 50% of the relevant investigation or screening level, and

- No single value should exceed 250% of the relevant investigation screening level.

Based on the above, the lead concentrations detected at A1-TP04 exceed the SAC by more than 250%. Isolated hot spots should not be reduced by statistical analysis and require remediation and/or management. In consideration that the lead was detected in surface soils and the close proximity to where lead shot was observed, the elevated lead concentrations in surface soils at location A1-TP04 are likely to associated with lead shot (fragment or whole shot) being present in the sample collected. It is also likely that elevated lead concentrations would also be present in areas where lead shot is present in surface soils (i.e. across the eastern portion of the site) as was evident in the elevated lead concentrations (above ecological investigation levels) detected in surface soils from A1_TP03 and A1_TP06. In context of the likely development at the site (comprising commercial/industrial facilities with minimal landscaping opportunities), elevated lead concentrations and visible lead shot in surface soils located within the north western portion of the site could impact upon the development or continued use of the site for airport related activities.

ACM was identified within fill material located across the central portion of the site. The ACM sampled comprised fragments of fibre cement sheeting and was in a good bonded condition (i.e. could not be crushed with hand force). Where ACM was observed, the fill material also contained quantities of miscellaneous materials including sandstone and general building wastes. These miscellaneous materials were also observed in the fill profile within the western portion of the site. In context of the likely development at the site (comprising commercial/industrial facilities with minimal landscaping opportunities), the areas of ACM impacted fill (as identified during the investigation) or within other fill material (if ACM present) could impact upon the development or continued use of the site for airport related activities.

14.2 Groundwater

The groundwater monitoring results indicated that the concentrations of compounds detected in groundwater wells subjected to monitoring were below the adopted SAC and airport regulations with the exception of pH, mercury, nickel and zinc.

pH levels in groundwater across the site were generally low with one location (A1-GW1) reporting levels below the lower criteria (pH 6.5) detailed in the Airport Regulations. With the absence of known actvities which could affect pH levels present surrounding this groundwater well location, lower pH levels could be attributable to a localised natural occurrence. Additionally, the actual quality of groundwater is likely to have been influenced by heavy rainfall and flooding events which occurred prior to sampling. With generally low pH levels detected in groundwater across the site (i.e. likely to be representative of background levels), the lower pH reported in A1-GW1 is unlikely to represent a risk to groundwater receptors.

Concentrations of nickel and zinc exceeded the SAC in A1-GW3. Based on the reduced level survey and calculated groundwater flow gradients, A1-GW3 is located in an up gradient position. It is acknowledged that the groundwater flow gradients may be affected by rainfall events and localised flooding of the Georges River prior to undertaking the monitoring event. Elevated concentrations nickel and zinc (i.e. concentrations above the SAC) were not reported in A1-GW1 and A1-GW2. It may be possible that the elevated nickel and zinc in groundwater at this location may be associated with run-off from the adjoining bus facility (especially run-off from metal roofs located within the bus facility).

A marginal exceedance of the mercury SAC was reported in groundwater well A1-GW2. Although the source of the mercury is not known (mercury was not detected in any soil sample analysed above the LOR), the concentration marginally above the SAC detected in A1-GW2 was not detected in down gradient location A1-GW1. This marginal exceedance of the SAC for mercury on groundwater is unlikely to require specific remediation and/or management.

15 Conclusions and Recommendations

Jacobs have undertaken the contamination investigation of the Site 1 (Link Road) located on a portion of airside land at Bankstown Airport, NSW.

Based on site observations and the results of the laboratory analysis, some contamination is present at the site which will need to be considered in context of the development of the site and ongoing airport land use as detailed below.

Lead concentrations in surface soils and areas of observable lead shot within the north eastern portion of the site will require remediation and/or management.

Based on the site observations and results of the laboratory analysis of the contamination investigation, Jacobs consider that the area where ACM was identified at the site will require remediation and/or management to facilitate site development and continued airport use.

There were some exceedances of groundwater guideline levels for pH, mercury, nickel and zinc. While the exceedance of the guideline levels is considered unlikely to impact upon the construction of the proposed facilities, should dewatering of excavations be required to facilitate construction, the water may require some treatment or management.

The presence of general building waste observed across the site could indicate potential contamination within this material in areas not tested as part of this investigation. To manage potential contamination, it is recommended that an unexpected finds protocol be developed and implemented during construction to manage potentially contaminated materials, should they be identified.

16 Limitations

The sole purpose of this report and the associated services performed by Jacobs is to assess the condition of the site (with respect to soil and groundwater contamination) in accordance with the scope of services set out in the contract between Jacobs and Bankstown Airport Limited (the Client). That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Client (if any), from observations made during the investigations and data from analytical laboratories. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

Figures

JACOBS NSW SPATIAL - GIS MAP file : IA110700_Figure1-1_Site1Locality_r1v1 | 6/07/2016

Legend

▨ Site 1 Location (approx.)

0 100 200m

N

1:5,000 @ A4

Data sources
Jacobs 2015
Ausimage 2014
RMS 2015
LPI 2015
© Land and Property Information 2015

Figure 1-1 | Site Location

JACOBS NSW SPATIAL - GIS MAP file : IA110700_Figure2-1_Site1SamplingLocations_r1v4 | 5/07/2016

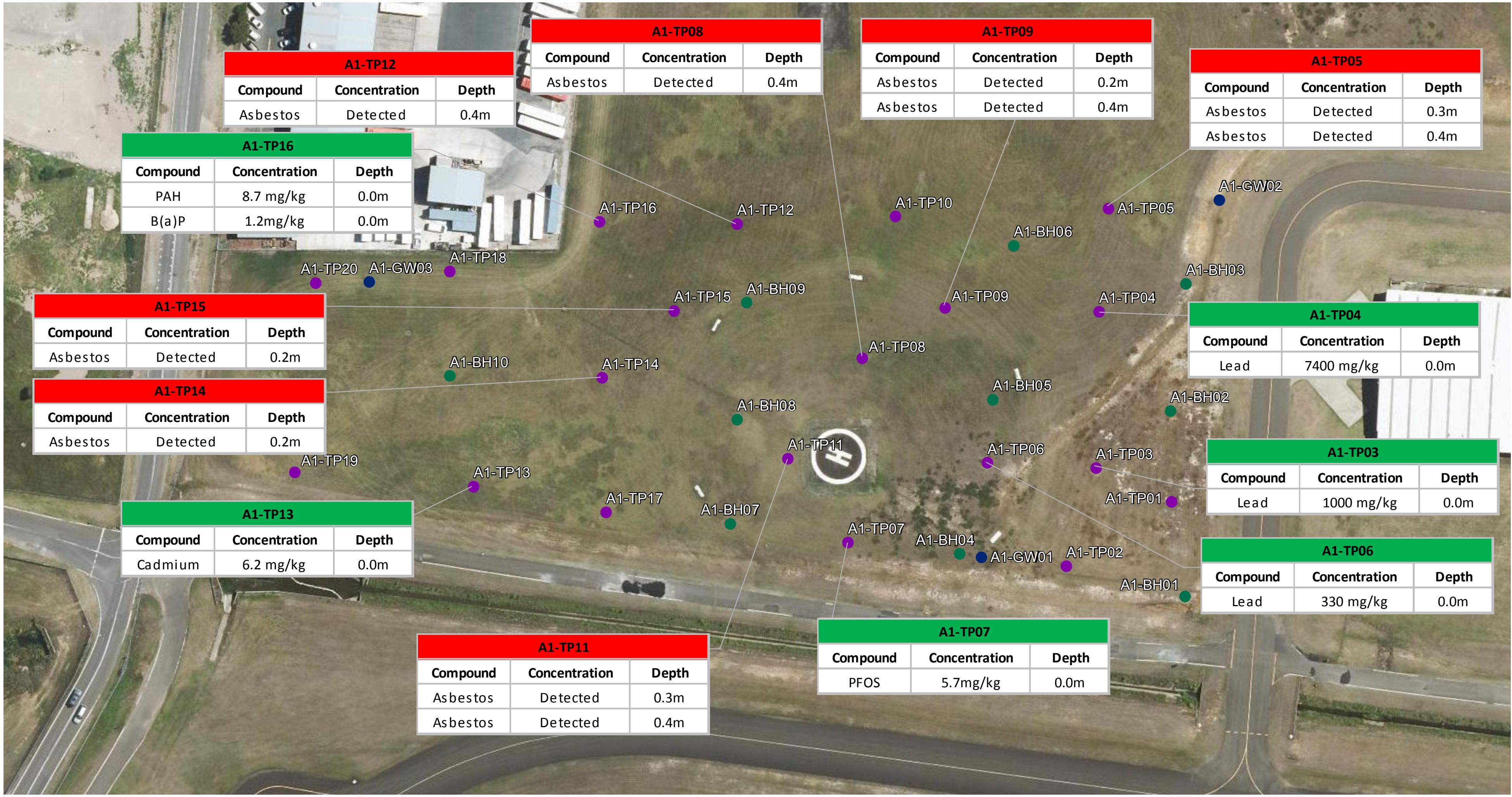
Legend

● Borehole
● Groundwater Well
● Test Pit

1:1,500 @ A4

Data sources
Jacobs 2015, Ausimage 2014, RMS 2015, LPI 2015

Figure 2-1 | Sampling Locations - Site 1



A1-TP08

Compound	Concentration	Depth
Asbestos	Detected	0.4m

A1-TP09

Compound	Concentration	Depth
Asbestos	Detected	0.2m
Asbestos	Detected	0.4m

A1-TP12

Compound	Concentration	Depth
Asbestos	Detected	0.4m

A1-TP05

Compound	Concentration	Depth
Asbestos	Detected	0.3m
Asbestos	Detected	0.4m

A1-TP16

Compound	Concentration	Depth
PAH	8.7 mg/kg	0.0m
B(a)P	1.2mg/kg	0.0m

A1-TP15

Compound	Concentration	Depth
Asbestos	Detected	0.2m

A1-TP04

Compound	Concentration	Depth
Lead	7400 mg/kg	0.0m

A1-TP14

Compound	Concentration	Depth
Asbestos	Detected	0.2m

A1-TP03

Compound	Concentration	Depth
Lead	1000 mg/kg	0.0m

A1-TP13

Compound	Concentration	Depth
Cadmium	6.2 mg/kg	0.0m

A1-TP06

Compound	Concentration	Depth
Lead	330 mg/kg	0.0m

A1-TP07

Compound	Concentration	Depth
PFOS	5.7mg/kg	0.0m

A1-TP11

Compound	Concentration	Depth
Asbestos	Detected	0.3m
Asbestos	Detected	0.4m

JACOBS NSW SPATIAL - GIS MAP file : IA110700_Figure3-1_ExceedancesOfSACSite1_r1v3 | 6/07/2016

Legend

●	Borehole	🟥	Concentration exceed HIL
●	Groundwater Well	🟩	Concentration exceed EIL
●	Test Pit		

0 20 40m

N

1:1,500 @ A4

Figure 3-1 | Exceedances of SAC - Site 1

Data sources
Jacobs 2015, Ausimage 2014, RMS 2015, LPI 2015
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Tables

Table A - Soil Analytical Results

		Reference	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM Table 1B(6) ESLs Commercial and Industrial	NEPM 2013 Table 1B(7) Management Limits for TPH fractions in soil	*Airport Regulations*	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324
		Sample Date					24/05/2016	25/05/2016	26/05/2016	24/05/2016	25/05/2016	26/05/2016	25/05/2016	25/05/2016	26/05/2016	26/05/2016
		Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Sample ID					A1_BH1_0.0	A1_BH2_0.0	A1_BH3_0.0	A1_BH4_0.5	A1_BH5_0.5	A1_BH6_0.5	A1_BH7_1.5	A1_BH8_0.0	A1_BH9_1.5	A1_BH10_0.0
ChemName	**Units**	**EQL**														
Metals																
Arsenic	mg/kg	2	3000[1]	160[4]		*500[6] / 20[12]*	4.3	11	-	5	16	-	5.2	7.4	-	-
Cadmium	mg/kg	0.4	900[1]	3[8]		*100[6] / 3[12]*	<0.4	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	-	-
Chromium (III+VI)	mg/kg	5	3600[1]	670[9]		*600,000[6] / 50[12]*	7.9	15	-	12	35	-	11	15	-	-
Copper	mg/kg	5	240,000[1]	198.7[9]		*5000[6] / 60[12]*	<5	<5	-	8.3	10	-	13	18	-	-
Lead	mg/kg	5	1500[1]	1810[9]		*1500[6] / 300[12]*	13	140	-	7.5	24	-	10	21	-	-
Mercury	mg/kg	0.05	730[1]	1[8]		*75[6] / 1[12]*	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	<0.05	-	-
Nickel	mg/kg	5	6000[1]	295[9]		*3000[6] / 60[12]*	<5	<5	-	<5	<5	-	<5	13	-	-
Zinc	mg/kg	5	400,000[1]	425[9]		*35,000[6] / 200[12]*	<5	6	-	5.5	9.5	-	7.4	24	-	-
Organochlorine Pesticides (OCPs)																
4,4-DDE	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05				*50[6] / 0.05[12]*	-	-	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg		45[1]			*20[6]*	-	-	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
chlordane	mg/kg	0.1	530[1]			*250[6]*	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
DDT	mg/kg	0.05		640[4]		*1000[6] / 0.97[12]*	-	-	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg		3600[1]				-	-	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05				*20[6] / 0.2[12]*	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05	2000[1]				-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05	2000[1]				-	-	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05	100[1]				-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05	50[1]			*50[6]*	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05	80[1]				-	-	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.05	2500[1]				-	-	-	-	-	-	-	-	-	-
Toxaphene	mg/kg	1	160[1]				-	-	-	-	-	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Acenaphthylene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Anthracene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Benz(a)anthracene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Benzo(a) pyrene	mg/kg	0.5		0.7[5]		*5[6]*	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5					0.6	0.6	-	0.6	0.6	-	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	40[1]				1.2	1.2	-	1.2	1.2	-	1.2	1.2	-	-
Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Chrysene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Fluoranthene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Fluorene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
PAHs (Sum of total)	mg/kg	0.5	4000[1]			*100[6] / 5[12]*	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Phenanthrene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Pyrene	mg/kg	0.5					<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Polychlorinated Biphenyls (PCBs)																
Arochlor 1016	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
Arochlor 1242	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
Arochlor 1248	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
Arochlor 1254	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
Arochlor 1260	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1				*1[12]*	-	-	-	-	-	-	-	-	-	-
TRH - Semivolatile Fraction																
C10-C16	mg/kg	50					<50	<50	-	<50	<50	-	<50	<50	-	-
C16-C34	mg/kg	100	27,000[3]	2500[5]	**5000[7]**		<100	<100	-	<100	<100	-	<100	<100	-	-
C34-C40	mg/kg	100	38,000[3]	6600[5]	**10,000[7]**		<100	<100	-	<100	<100	-	<100	<100	-	-
F2-NAPHTHALENE	mg/kg	50	20,000[3]	170[5]	**1000[7]**		<50	<50	-	<50	<50	-	<50	<50	-	-
C10 - C14	mg/kg	20					<20	<20	-	<20	<20	-	<20	<20	-	-
C15 - C28	mg/kg	50					<50	<50	-	<50	<50	-	<50	<50	-	-
C29-C36	mg/kg	50					<50	<50	-	<50	<50	-	<50	69	-	-
+C10 - C36 (Sum of total)	mg/kg	50				*1,000[12]*	<50	<50	-	<50	<50	-	<50	69	-	-
TRH / BTEX																
Benzene	mg/kg	0.1	4[2]	95[5]		*1[6] / 0.5[12]*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	27,000[3]	185[5]		*50[6] / 5[12]*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	-	-
Toluene	mg/kg	0.1	99,000[3]	135[5]		*130[6] / 3[12]*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	81,000[3]	95[5]		*25[6] / 5[12]*	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
C6 - C9	mg/kg	20				*800[6] / 100[12]*	<20	<20	-	<20	<20	-	<20	<20	-	-
C6-C10 less BTEX (F1)	mg/kg	20	310[2]	215[5]	**800[7]**		<20	<20	-	<20	<20	-	<20	<20	-	-
C6-C10	mg/kg	20					<20	<20	-	<20	<20	-	<20	<20	-	-
Perfluorinated Compounds (PFCs)																
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.01	900[10]				-	-	-	-	-	-	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.005	90[10]	4.71[10]			-	-	-	-	-	-	-	-	-	-
Perfluorooctanoate	mg/kg	0.005	240[10]	3.73[10]			-	-	-	-	-	-	-	-	-	-
Asbestos																
Asbestos from ACM in Soil	%w/w		0.05[11]				-	-	-	-	-	-	-	-	-	-
Asbestos from FA & AF in Soil	%w/w	0.001	0.001[11]				-	-	-	-	-	-	-	-	-	-
Asbestos Sample Dimensions	Comment						-	-	-	-	-	-	-	-	-	-
Mass ACM	g						-	-	-	-	-	-	-	-	-	-
Mass AF	g						-	-	-	-	-	-	-	-	-	-
Mass FA	g						-	-	-	-	-	-	-	-	-	-
Asbestos Fibres	Comment						-	-	-	-	-	-	-	-	-	-
% Clay	%	1					-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					6.1	7.2	9	20	19	6.8	15	11	19	6.6
pH (Lab)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-

Reference	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324
Sample Date	25/05/2016	25/05/2016	27/05/2016	27/05/2016	27/05/2016	25/05/2016	25/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	27/05/2016	27/05/2016	27/05/2016
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID	A1_TP01_0.0	A1_TP01_1.0	A1_TP02_0.0	A1_TP02_0.2	A1_TP02_2.5	A1_TP03_0.0	A1_TP03_0.5	A1_TP04_0.0	A1_TP05_0.0	A1_TP05_0.3	A1_TP05_0.7	A1_TP05_ASB_0.3	A1_TP05_ASB_0.4	A1_TP06_0.0	A1_TP06_0.3	A1_TP07_0.0
ChemName																
Metals																
Arsenic	4.1	8.7	2.8	-	5.9	2.6	7.4	16	10	-	11	-	-	5.9	5.5	8.3
Cadmium	<0.4	<0.4	0.6	-	<0.4	<0.4	<0.4	<0.4	<0.4	-	<0.4	-	-	0.5	<0.4	<0.4
Chromium (III+VI)	7.6	23	7.3	-	10	6.5	24	8.4	30	-	12	-	-	14	9.1	19
Copper	<5	12	5.6	-	8.7	5.4	7.3	10	9.8	-	8.2	-	-	9.5	<5	20
Lead	100	17	17	-	10	*1000*	12	*7400*	58	-	120	-	-	*330*	10	280
Mercury	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	0.05	-	<0.05	-	-	<0.05	<0.05	<0.05
Nickel	<5	<5	<5	-	<5	<5	<5	<5	9	-	<5	-	-	7.6	<5	9.5
Zinc	14	16	9.2	-	<5	29	<5	24	47	-	33	-	-	32	<5	52
Organochlorine Pesticides (OCPs)																
4,4-DDE	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
a-BHC	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Aldrin	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Aldrin + Dieldrin	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1
b-BHC	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
chlordane	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	-	-	-	-	<0.1	-	<0.1
d-BHC	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
DDD	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
DDT	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
DDT+DDE+DDD	<0.15	-	<0.15	-	-	<0.15	-	-	<0.15	-	-	-	-	<0.15	-	<0.15
Dieldrin	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Endosulfan I	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Endosulfan II	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Endosulfan sulphate	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Endrin	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Endrin aldehyde	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Endrin ketone	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
g-BHC (Lindane)	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Heptachlor	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Heptachlor epoxide	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Hexachlorobenzene	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	-	-	<0.05	-	<0.05
Methoxychlor	<0.2	-	<0.2	-	-	<0.2	-	-	<0.2	-	-	-	-	<0.2	-	<0.2
Toxaphene	<1	-	<1	-	-	<1	-	-	<1	-	-	-	-	<1	-	<1
Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Acenaphthylene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Anthracene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Benz(a)anthracene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Benzo(a) pyrene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (lower bound) *	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (medium bound) *	0.6	0.6	0.6	-	0.6	0.6	0.6	0.6	0.6	-	0.6	-	-	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	-	1.2	-	-	1.2	1.2	1.2
Benzo[b+j]fluoranthene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Chrysene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Fluoranthene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Fluorene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Naphthalene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
PAHs (Sum of total)	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Phenanthrene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Pyrene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Polychlorinated Biphenyls (PCBs)																
Arochlor 1016	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
Arochlor 1221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1232	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
Arochlor 1242	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
Arochlor 1248	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
Arochlor 1254	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
Arochlor 1260	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
PCBs (Sum of total)	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	-	-	-	-	<0.5	-	<0.5
TRH - Semivolatile Fraction																
C10-C16	<50	<50	<50	-	<50	<50	<50	<50	<50	-	<50	-	-	<50	<50	<50
C16-C34	<100	<100	<100	-	<100	400	<100	130	<100	-	<100	-	-	210	<100	<100
C34-C40	<100	<100	<100	-	<100	<100	<100	<100	<100	-	<100	-	-	<100	<100	<100
F2-NAPHTHALENE	<50	<50	<50	-	<50	<50	<50	<50	<50	-	<50	-	-	<50	<50	<50
C10 - C14	<20	<20	<20	-	<20	36	<20	<20	<20	-	<20	-	-	<20	<20	<20
C15 - C28	<50	<50	<50	-	<50	190	<50	55	<50	-	<50	-	-	74	<50	<50
C29-C36	<50	<50	<50	-	<50	240	<50	96	<50	-	<50	-	-	150	<50	80
+C10 - C36 (Sum of total)	<50	<50	<50	-	<50	466	<50	151	<50	-	<50	-	-	224	<50	80
TRH / BTEX																
Benzene	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1
Ethylbenzene	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1
Naphthalene	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	<0.5	<0.5	<0.5
Toluene	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1
Xylene (m & p)	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	-	<0.2	<0.2	<0.2
Xylene (o)	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	-	-	<0.1	<0.1	<0.1
Xylene Total	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	-	-	<0.3	<0.3	<0.3
C6 - C9	<20	<20	<20	-	<20	<20	<20	<20	<20	-	<20	-	-	<20	<20	<20
C6-C10 less BTEX (F1)	<20	<20	<20	-	<20	<20	<20	<20	<20	-	<20	-	-	<20	<20	<20
C6-C10	<20	<20	<20	-	<20	<20	<20	<20	<20	-	<20	-	-	<20	<20	<20
Perfluorinated Compounds (PFCs)																
6:2 Fluorotelomer Sulfonate (6:2 FtS)	<0.01	-	<0.01	-	-	0.04	-	-	<0.01	-	-	-	-	<0.01	-	<0.01
Perfluorooctanesulfonic acid (PFOS)	0.22	-	2	-	-	3.8	-	-	0.012	-	-	-	-	3.4	-	5.7
Perfluorooctanoate	0.006	-	0.024	-	-	0.046	-	-	<0.005	-	-	-	-	0.006	-	0.006
Asbestos																
Asbestos from ACM in Soil	0	-	-	0	-	-	-	0	-	0	-	0	0	0	-	0
Asbestos from FA & AF in Soil	<0.001	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	-	-	<0.001	-	<0.001
Asbestos Sample Dimensions	-	-	-	-	-	-	-	-	-	-	-	80x60x5	140x50x5	-	-	-
Mass ACM	0	-	-	0	-	-	-	0	-	0	-	28	42	0	-	0
Mass AF	0	-	-	0	-	-	-	0	-	0	-	0	0	0	-	0
Mass FA	0	-	-	0	-	-	-	0	-	0	-	0	0	0	-	0
Asbestos Fibres	ND	-	-	ND	-	-	-	ND	-	ND	-	ND	ND	ND	-	ND
% Clay	-	-	-	-	48	-	-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	6.1	23	4.2	-	16	12	23	7.7	13	-	8.6	-	-	5.9	15	8.1
pH (Lab)	-	-	-	-	5.3	-	-	-	-	-	-	-	-	-	-	-

Notes:

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct contact, Technical Report 10.

[4] NEPC (2013) Generic calculated EIL from Table 1B(5) Commercial and Industrial.

[5] NEPC (2013) Table 1 B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial

[6] Airports (Environment Protection) Regulations 1997

[7] NEPC (2013) Table 1B(7) Management Limits for TPH fractions F1 - F4 in soil - Commercial and Industrial

[8] NEPM 1999 generated EILs (no EIL provided in NEPC 2013)

[9] EILs derived from NEPM 2013 equation ABC+ACL.

[10] GHD (2015) Table 1 Interim Screening Levels (ISLs), Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework

[11] WA DOH (2009) Soil asbestos investigation criteria

[12] Airports (Environment Protection) Regulations 1997 - Table 2 Areas of environmental significance

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

Table A - Soil Analytical Results

		Reference	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM Table 1B(6) ESLs Commercial and Industrial	NEPM 2013 Table 1B(7) Management Limits for TPH fractions in soil	Airport Regulations	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	502324	506133	506133	502324	502324	502324	502324	502800	502800	502324	502324	502324	502324
		Sample Date					27/05/2016	27/05/2016	27/05/2016	27/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016	26/05/2016	26/05/2016	26/05/2016	30/05/2016	30/05/2016	26/05/2016	26/05/2016	26/05/2016	26/05/2016
		Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Sample ID					A1_TP07_0.5	A1_TP08_0.3	A1_TP08_0.5	A1_TP08_ASB_0.4	A1_TP09_0.2	A1_TP09_0.5	A1_TP09_ASB_0.2	A1_TP09_ASB_0.4	A1_TP10_0.0	A1_TP10_2.0	A1_TP11_0.0	A1_TP11_0.3	A1_TP11_ASB_0.3	A1_TP11_ASB_0.4	A1_TP11_0.5	A1_TP12_0.0	A1_TP12_0.5	A1_TP12_ASB_0.4	A1_TP13_0.0	A1_TP13_0.4	A1_TP14_0.0	A1_TP14_1.0	A1_TP14_ASB_0.2	A1_TP15_0.5
ChemName	**Units**	**EQL**																												
Metals																														
Arsenic	mg/kg	2	3000[1]	160[4]		500[6] / 20[12]	5.6	-	15	-	-	15	-	-	8.9	7.2	9.9	-			9.1	3.7	15	-	4	<2	8.7	6.3	-	9.1
Cadmium	mg/kg	0.4	900[1]	3[8]		100[6] / 3[12]	<0.4	-	<0.4	-	-	<0.4	-	-	<0.4	<0.4	<0.4	-			<0.4	0.9	<0.4	-	6.2	0.6	<0.4	<0.4	-	<0.4
Chromium (III+VI)	mg/kg	5	3600[1]	670[9]		600,000[6] / 50[12]	19	-	33	-	-	38	-	-	17	20	17	-			16	14	17	-	34	<5	18	19	-	17
Copper	mg/kg	5	240,000[1]	198.7[9]		5000[6] / 60[12]	9.6	-	16	-	-	12	-	-	16	10	21	-			29	28	52	-	24	<5	15	8.5	-	9.3
Lead	mg/kg	5	1500[1]	1810[9]		1500[6] / 300[12]	11	-	270	-	-	38	-	-	54	15	110	-			120	32	33	-	34	<5	21	10	-	65
Mercury	mg/kg	0.05	730[1]	1[8]		75[6] / 1[12]	<0.05	-	<0.05	-	-	<0.05	-	-	<0.05	<0.05	<0.05	-			<0.05	<0.05	<0.05	-	<0.1	<0.1	<0.05	<0.05	-	<0.05
Nickel	mg/kg	5	6000[1]	295[9]		3000[6] / 60[12]	<5	-	6.9	-	-	6.9	-	-	8.2	<5	9.5	-			16	40	26	-	8.6	<5	5	<5	-	<5
Zinc	mg/kg	5	400,000[1]	425[9]		35,000[6] / 200[12]	<5	-	33	-	-	21	-	-	30	<5	38	-			55	55	100	-	57	<5	19	<5	-	30
Organochlorine Pesticides (OCPs)																														
4,4-DDE	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
a-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Aldrin	mg/kg	0.05				50[6] / 0.05[12]	-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Aldrin + Dieldrin	mg/kg		45[1]			20[6]	-	-	-	-	-	-	-	-	<0.1	-	<0.1	-			-	<0.1	-	-	<0.1	-	<0.1	-	-	-
b-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
chlordane	mg/kg	0.1	530[1]			250[6]	-	-	-	-	-	-	-	-	<0.1	-	<0.1	-			-	<0.1	-	-	<0.1	-	<0.1	-	-	-
d-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
DDD	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
DDT	mg/kg	0.05		640[4]		1000[6] / 0.97[12]	-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
DDT+DDE+DDD	mg/kg		3600[1]				-	-	-	-	-	-	-	-	<0.15	-	<0.15	-			-	<0.15	-	-	<0.15	-	<0.15	-	-	-
Dieldrin	mg/kg	0.05				20[6] / 0.2[12]	-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Endosulfan I	mg/kg	0.05	2000[1]				-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Endosulfan II	mg/kg	0.05	2000[1]				-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Endosulfan sulphate	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Endrin	mg/kg	0.05	100[1]				-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Endrin aldehyde	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
g-BHC (Lindane)	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Heptachlor	mg/kg	0.05	50[1]			50[6]	-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Heptachlor epoxide	mg/kg	0.05					-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Hexachlorobenzene	mg/kg	0.05	80[1]				-	-	-	-	-	-	-	-	<0.05	-	<0.05	-			-	<0.05	-	-	<0.05	-	<0.05	-	-	-
Methoxychlor	mg/kg	0.05	2500[1]				-	-	-	-	-	-	-	-	<0.2	-	<0.2	-			-	<0.2	-	-	<0.05	-	<0.2	-	-	-
Toxaphene	mg/kg	1	160[1]				-	-	-	-	-	-	-	-	<1	-	<1	-			-	<1	-	-	<1	-	<1	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																														
Acenaphthene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Anthracene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(a) pyrene	mg/kg	0.5		0.7[5]		5[6]	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5					0.6	-	0.6	-	-	0.6	-	-	0.6	0.6	0.6	-			0.6	0.6	0.6	-	0.6	0.6	0.6	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	40[1]				1.2	-	1.2	-	-	1.2	-	-	1.2	1.2	1.2	-			1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	-	1.2
Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Chrysene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Fluoranthene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Fluorene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
PAHs (Sum of total)	mg/kg	0.5	4000[1]			100[6] / 5[12]	<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Phenanthrene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Pyrene	mg/kg	0.5					<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Polychlorinated Biphenyls (PCBs)																														
Arochlor 1016	mg/kg	0.1					-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	<0.1	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
Arochlor 1242	mg/kg	0.1					-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
Arochlor 1248	mg/kg	0.1					-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
Arochlor 1254	mg/kg	0.1					-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
Arochlor 1260	mg/kg	0.1					-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
PCBs (Sum of total)	mg/kg	0.1				1[12]	-	-	-	-	-	-	-	-	<0.5	-	<0.5	-			-	<0.5	-	-	<0.1	-	<0.5	-	-	-
TRH - Semivolatile Fraction																														
C10-C16	mg/kg	50					<50	-	<50	-	-	<50	-	-	<50	<50	<50	-			<50	<50	<50	-	<50	<50	<50	<50	-	<50
C16-C34	mg/kg	100	27,000[3]	2500[5]	**5000[7]**		<100	-	<100	-	-	<100	-	-	360	<100	<100	-			140	190	<100	-	180	<100	<100	<100	-	<100
C34-C40	mg/kg	100	38,000[3]	6600[5]	**10,000[7]**		<100	-	<100	-	-	<100	-	-	<100	<100	<100	-			110	<100	<100	-	<100	<100	<100	<100	-	<100
F2-NAPHTHALENE	mg/kg	50	20,000[3]	170[5]	**1000[7]**		<50	-	<50	-	-	<50	-	-	<50	<50	<50	-			<50	<50	<50	-	<50	<50	<50	<50	-	<50
C10 - C14	mg/kg	20					<20	-	<20	-	-	<20	-	-	<20	<20	<20	-			<20	<20	<20	-	<20	<20	<20	<20	-	<20
C15 - C28	mg/kg	50					<50	-	<50	-	-	<50	-	-	150	<50	<50	-			<50	<50	<50	-	150	<50	<50	<50	-	<50
C29-C36	mg/kg	50					<50	-	<50	-	-	<50	-	-	220	<50	<50	-			170	200	75	-	<50	<50	<50	<50	-	<50
+C10 - C36 (Sum of total)	mg/kg	50				1,000[12]	<50	-	<50	-	-	<50	-	-	370	<50	<50	-			170	200	75	-	150	<50	<50	<50	-	<50
TRH / BTEX																														
Benzene	mg/kg	0.1	4[2]	95[5]		1[6] / 0.5[12]	<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
Ethylbenzene	mg/kg	0.1	27,000[3]	185[5]		50[6] / 5[12]	<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
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	-	<0.5	-	-	<0.5	-	-	<0.5	<0.5	<0.5	-			<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5
Toluene	mg/kg	0.1	99,000[3]	135[5]		130[6] / 3[12]	<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
Xylene (m & p)	mg/kg	0.2					<0.2	-	<0.2	-	-	<0.2	-	-	<0.2	<0.2	<0.2	-			<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2
Xylene (o)	mg/kg	0.1					<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	<0.1	<0.1	-			<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1
Xylene Total	mg/kg	0.3	81,000[3]	95[5]		25[6] / 5[12]	<0.3	-	<0.3	-	-	<0.3	-	-	<0.3	<0.3	<0.3	-			<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	-	<0.3
C6 - C9	mg/kg	20				800[6] / 100[12]	<20	-	<20	-	-	<20	-	-	<20	<20	<20	-			<20	<20	<20	-	<20	<20	<20	<20	-	<20
C6-C10 less BTEX (F1)	mg/kg	20	310[2]	215[5]	**800[7]**		<20	-	<20	-	-	<20	-	-	<20	<20	<20	-			<20	<20	<20	-	<20	<20	<20	<20	-	<20
C6-C10	mg/kg	20					<20	-	<20	-	-	<20	-	-	<20	<20	<20	-			<20	<20	<20	-	<20	<20	<20	<20	-	<20
Perfluorinated Compounds (PFCs)																														
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.01	900[10]				-	-	-	-	-	-	-	-	<0.01	-	<0.01	-			-	<0.01	-	-	<0.01	-	<0.01	-	-	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.005	90[10]	4.71[10]			-	-	-	-	-	-	-	-	0.018	-	0.23	-			-	0.012	-	-	0.03	-	<0.005	-	-	-
Perfluorooctanoate	mg/kg	0.005	240[10]	3.73[10]			-	-	-	-	-	-	-	-	<0.005	-	<0.005	-			-	<0.005	-	-	<0.005	-	<0.005	-	-	-
Asbestos																														
Asbestos from ACM in Soil	%w/w		0.05[11]				-	0	-	0	0	-	0	0	-	-	0	0	0	0	-	0	-	0	0	-	0	-	0	-
Asbestos from FA & AF in Soil	%w/w	0.001	0.001[11]				-	<0.001	-	-	<0.001	-	-	-	-	-	<0.001	<0.001	-	-	-	<0.001	-	-	<0.001	-	<0.001	-	-	-
Asbestos Sample Dimensions	Comment						-	-	-	80x25x5	-	-	140x65x5	111x60x5	-	-	-	-	70x55x5	70x60x5	-	-	-	60x40x7	-	-	-	-	55x41x5	-
Mass ACM	g						-	0	-	19	0	-	60	119	-	-	0	0	23	25	-	0	-	30	0	-	0	-	13	-
Mass AF	g						-	0	-	0	0	-	0	0	-	-	0	0	0	0	-	0	-	0	0	-	0	-	0	-
Mass FA	g						-	0	-	0	0	-	0	0	-	-	0	0	0	0	-	0	-	0	0	-	0	-	0	-
Asbestos Fibres	Comment						-	ND	-	ND	ND	-	ND	ND	-	-	ND	ND	ND	ND	-	ND	-	ND	ND	-	ND	-	ND	-
% Clay	%	1					-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					18	-	16	-	-	22	-	-	14	23	8.4	-			8.2	5.8	10	-	6	1.2	15	20	-	7.9
pH (Lab)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-

Notes:

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct

[4] NEPC (2013) Generic calculated EIL from Table 1B(5) Commercial and Industrial.

[5] NEPC (2013) Table 1 B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial

[6] Airports (Environment Protection) Regulations 1997

[7] NEPC (2013) Table 1B(7) Management Limits for TPH fractions F1 - F4 in soil - Commercial and Industrial

[8] NEPM 1999 generated EILs (no EIL provided in NEPC 2013)

[9] EILs derived from NEPM 2013 equation ABC+ACL.

[10] GHD (2015) Table 1 Interim Screening Levels (ISLs), Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework

[11] WA DOH (2009) Soil asbestos investigation criteria

[12] Airports (Environment Protection) Regulations 1997 - Table 2 Areas of environmental significance

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

Table A - Soil Analytical Results

Reference			NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM Table 1B(6) ESLs Commercial and Industrial	**NEPM 2013 Table 1B(7) Management Limits for TPH fractions in soil**	*Airport Regulations*	502324	502800	502800	502324	502324	502324	502324	502800	502800	502800	502800
Sample Date							26/05/2016	30/05/2016	30/05/2016	27/05/2016	27/05/2016	27/05/2016	27/05/2016	30/05/2016	30/05/2016	30/05/2016	30/05/2016
Matrix							Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID							A1_TP15_ASB_0.2	A1_TP16_0.0	A1_TP16_1.0	A1_TP17_0.0	A1_TP17_1.0	A1_TP18_0.0	A1_TP18_0.5	A1_TP19_0.0	A1_TP19_0.3	A1_TP20_0.0	A1_TP20_2.0
ChemName	**Units**	**EQL**															
Metals																	
Arsenic	mg/kg	2	3000[1]	160[4]		*500[6] / 20[12]*	-	4.4	8.7	4.1	2.8	7.5	8.3	5.1	-	4.1	3.9
Cadmium	mg/kg	0.4	900[1]	3[8]		*100[6] / 3[12]*	-	<0.4	<0.4	1.2	<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	3600[1]	670[9]		*600,000[6] / 50[12]*	-	19	28	13	6	13	22	9.9	-	9.4	13
Copper	mg/kg	5	240,000[1]	198.7[9]		*5000[6] / 60[12]*	-	24	14	10	<5	9.9	15	9.7	-	11	10
Lead	mg/kg	5	1500[1]	1810[9]		*1500[6] / 300[12]*	-	30	10	52	6.7	20	16	48	-	15	8.2
Mercury	mg/kg	0.05	730[1]	1[8]		*75[6] / 1[12]*	-	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	-	<0.1	<0.1
Nickel	mg/kg	5	6000[1]	295[9]		*3000[6] / 60[12]*	-	22	6.4	5.5	<5	5.3	7.7	6.3	-	6.6	<5
Zinc	mg/kg	5	400,000[1]	425[9]		*35,000[6] / 200[12]*	-	45	6.7	26	<5	14	13	21	-	17	7.3
Organochlorine Pesticides (OCPs)																	
4,4-DDE	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
a-BHC	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Aldrin	mg/kg	0.05				*50[6] / 0.05[12]*	-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Aldrin + Dieldrin	mg/kg		45[1]			*20[6]*	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-
b-BHC	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
chlordane	mg/kg	0.1	530[1]			*250[6]*	-	<0.1	-	<0.1	-	<0.1	-	-	-	<0.1	-
d-BHC	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
DDD	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
DDT	mg/kg	0.05		640[4]		*1000[6] / 0.97[12]*	-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
DDT+DDE+DDD	mg/kg		3600[1]				-	<0.15	-	<0.15	-	<0.15	-	-	-	<0.15	-
Dieldrin	mg/kg	0.05				*20[6] / 0.2[12]*	-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endosulfan I	mg/kg	0.05	2000[1]				-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endosulfan II	mg/kg	0.05	2000[1]				-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endosulfan sulphate	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endrin	mg/kg	0.05	100[1]				-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endrin aldehyde	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Endrin ketone	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
g-BHC (Lindane)	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Heptachlor	mg/kg	0.05	50[1]			*50[6]*	-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Heptachlor epoxide	mg/kg	0.05					-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Hexachlorobenzene	mg/kg	0.05	80[1]				-	<0.05	-	<0.05	-	<0.05	-	-	-	<0.05	-
Methoxychlor	mg/kg	0.05	2500[1]				-	<0.05	-	<0.2	-	<0.2	-	-	-	<0.05	-
Toxaphene	mg/kg	1	160[1]				-	<1	-	<1	-	<1	-	-	-	<1	-
Polycyclic Aromatic Hydrocarbons (PAHs)																	
Acenaphthene	mg/kg	0.5					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Anthracene	mg/kg	0.5					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5					-	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		0.7[5]		*5[6]*	-	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5					-	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5					-	1.8	0.6	0.6	0.6	0.6	0.6	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	40[1]				-	2.1	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2
Benzo[b+j]fluoranthene	mg/kg	0.5					-	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					-	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					-	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Chrysene	mg/kg	0.5					-	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Fluoranthene	mg/kg	0.5					-	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Fluorene	mg/kg	0.5					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					-	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	4000[1]			*100[6] / 5[12]*	-	*8.7*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Phenanthrene	mg/kg	0.5					-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Pyrene	mg/kg	0.5					-	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Polychlorinated Biphenyls (PCBs)																	
Arochlor 1016	mg/kg	0.1					-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
Arochlor 1221	mg/kg	0.1					-	<0.1	-	-	-	-	-	-	-	<0.1	-
Arochlor 1232	mg/kg	0.1					-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
Arochlor 1242	mg/kg	0.1					-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
Arochlor 1248	mg/kg	0.1					-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
Arochlor 1254	mg/kg	0.1					-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
Arochlor 1260	mg/kg	0.1					-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
PCBs (Sum of total)	mg/kg	0.1				*1[12]*	-	<0.1	-	<0.5	-	<0.5	-	-	-	<0.1	-
TRH - Semivolatile Fraction																	
C10-C16	mg/kg	50					-	<50	<50	<50	<50	<50	<50	<50	-	<50	<50
C16-C34	mg/kg	100	27,000[3]	2500[5]	**5000**[7]		-	180	<100	<100	<100	<100	<100	<100	-	<100	<100
C34-C40	mg/kg	100	38,000[3]	6600[5]	**10,000**[7]		-	<100	<100	<100	<100	<100	<100	<100	-	<100	<100
F2-NAPHTHALENE	mg/kg	50	20,000[3]	170[5]	**1000**[7]		-	<50	<50	<50	<50	<50	<50	<50	-	<50	<50
C10 - C14	mg/kg	20					-	<20	<20	<20	<20	<20	<20	<20	-	<20	<20
C15 - C28	mg/kg	50					-	77	<50	<50	<50	<50	<50	<50	-	<50	<50
C29-C36	mg/kg	50					-	170	<50	<50	<50	<50	<50	<50	-	<50	<50
+C10 - C36 (Sum of total)	mg/kg	50				*1,000[12]*	-	247	<50	<50	<50	<50	<50	<50	-	<50	<50
TRH / BTEX																	
Benzene	mg/kg	0.1	4[2]	95[5]		*1[6] / 0.5[12]*	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	27,000[3]	185[5]		*50[6] / 5[12]*	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5
Toluene	mg/kg	0.1	99,000[3]	135[5]		*130[6] / 3[12]*	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2					-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2
Xylene (o)	mg/kg	0.1					-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1
Xylene Total	mg/kg	0.3	81,000[3]	95[5]		*25[6] / 5[12]*	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3
C6 - C9	mg/kg	20				*800[6] / 100[12]*	-	<20	<20	<20	<20	<20	<20	<20	-	<20	<20
C6-C10 less BTEX (F1)	mg/kg	20	310[2]	215[5]	**800**[7]		-	<20	<20	<20	<20	<20	<20	<20	-	<20	<20
C6-C10	mg/kg	20					-	<20	<20	<20	<20	<20	<20	<20	-	<20	<20
Perfluorinated Compounds (PFCs)																	
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.01	900[10]				-	<0.01	-	<0.01	-	<0.01	-	-	-	<0.01	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.005	90[10]	4.71[10]			-	0.012	-	0.011	-	0.006	-	-	-	<0.005	-
Perfluorooctanoate	mg/kg	0.005	240[10]	3.73[10]			-	<0.005	-	<0.005	-	<0.005	-	-	-	<0.005	-
Asbestos																	
Asbestos from ACM in Soil	%w/w		0.05[11]				0	0	-	-	-	0	-	-	0	-	-
Asbestos from FA & AF in Soil	%w/w	0.001	0.001[11]				-	<0.001	-	-	-	<0.001	-	-	<0.001	-	-
Asbestos Sample Dimensions	Comment						50x34x8	-	-	-	-	-	-	-	-	-	-
Mass ACM	g						18	0	-	-	-	0	-	-	0	-	-
Mass AF	g						0	0	-	-	-	0	-	-	0	-	-
Mass FA	g						0	0	-	-	-	0	-	-	0	-	-
Asbestos Fibres	Comment						ND	ND	-	-	-	ND	-	-	ND	-	-
% Clay	%	1					-	-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					-	5.7	23	24	14	22	15	6.9	-	8.3	17
pH (Lab)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-

Notes:

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct

[4] NEPC (2013) Generic calculated EIL from Table 1B(5) Commercial and Industrial.

[5] NEPC (2013) Table 1 B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial

[6] Airports (Environment Protection) Regulations 1997

[7] NEPC (2013) Table 1B(7) Management Limits for TPH fractions F1 - F4 in soil - Commercial and Industrial

[8] NEPM 1999 generated EILs (no EIL provided in NEPC 2013)

[9] EILs derived from NEPM 2013 equation ABC+ACL.

[10] GHD (2015) Table 1 Interim Screening Levels (ISLs), Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework

[11] WA DOH (2009) Soil asbestos investigation criteria

[12] Airports (Environment Protection) Regulations 1997 - Table 2 Areas of environmental significance

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

Table B - Groundwater Analytical Results

	Reference		**GIL**	**HSLs**	*Airport Regulations*	505193	505193	505193
	Matrix					Water	Water	Water
	Date Sampled					20/06/2016	20/06/2016	20/06/2016
	Borehole ID					A1 - GW1	A1 - GW2	A1 - GW3
ChemName	**Units**	**EQL**						
Dissolved Metals								
Arsenic (Filtered)	µg/L	1	24[1]		*50*[7]	<1	<1	3
Cadmium (Filtered)	µg/L	0.1	0.7[12]		*2.0*[7]	0.1	<1	<1
Chromium (III+VI) (Filtered)	µg/L	1	4.4[13]		*50*[7]	<1	<1	<1
Copper (Filtered)	µg/L	1	1.3[13]		*5.0*[7]	<1	<1	1
Lead (Filtered)	µg/L	1	4.4[13]		*5.0*[7]	<1	<1	3
Mercury (Filtered)	µg/L	0.1	0.1[12]		*0.1*[7]	<0.1	*0.2*	<0.1
Nickel (Filtered)	µg/L	1	7[12]		*15*[7]	3	3	*62*
Zinc (Filtered)	µg/L	5	15[13]		*50*[7]	8	13	*57*
Perfluorinated Compounds (PFCs)								
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	5[9]			<0.05	<0.05	<0.05
Perfluorooctanoate	µg/L	0.01	0.4[9]			<0.01	<0.01	<0.01
PFOS	µg/L	0.01	0.2[9]			<0.01	0.02	0.01
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	µg/L	0.01				<0.01	<0.01	<0.01
Acenaphthylene	µg/L	0.01				<0.01	<0.01	<0.01
Anthracene	µg/L	0.01				<0.01	<0.01	<0.01
Benz(a)anthracene	µg/L	0.01				<0.01	<0.01	<0.01
Benzo(a) pyrene	µg/L	0.01	0.01[5]			<0.01	<0.01	<0.01
Benzo[b+j]fluoranthene	mg/L	0.00001				<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene	µg/L	0.01				<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01				<0.01	<0.01	<0.01
Chrysene	µg/L	0.01				<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01
Fluoranthene	µg/L	0.01				<0.01	<0.01	<0.01
Fluorene	µg/L	0.01				<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L	0.01				<0.01	<0.01	<0.01
Naphthalene	µg/L	0.01	50[12]	**NL**[6]		<0.01	0.1	<0.01
PAHs (Sum of total)	µg/L	0.01				<0.05	0.1	<0.05
Phenanthrene	µg/L	0.01				<0.01	<0.01	<0.01
Pyrene	µg/L	0.01				<0.01	<0.01	<0.01
TRH - Semivolatile Fraction								
C10-C16	mg/L	0.05				<0.05	<0.05	<0.05
C16-C34	mg/L	0.1				<0.1	<0.1	<0.1
C34-C40	mg/L	0.1				<0.1	<0.1	<0.1
F2-NAPHTHALENE	mg/L	0.05		**NL**[6]		<0.05	<0.05	<0.05
C10 - C14	µg/L	50				<50	100	<50
C15 - C28	µg/L	100				<100	<100	<100
C29-C36	µg/L	100				<100	<100	<100
+C10 - C36 (Sum of total)	µg/L	100	600[4]			<100	100	<100
TRH Volatiles/BTEX								
Benzene	µg/L	1	500[12]	**30,000**[6]	*300*[7]	<1	<1	<1
Ethylbenzene	µg/L	1	140[3]	**NL**[6]		<1	<1	<1
Naphthalene	µg/L	10	50[12]	**NL**[6]		<10	<10	<10
Toluene	µg/L	1	300[3]	**NL**[6]		<1	<1	<1
Xylene (m & p)	µg/L	2				<2	<2	<2
Xylene (o)	µg/L	1	350[1]			<1	<1	<1
Xylene Total	µg/L	3	380[3]	**NL**[6]		<3	<3	<3
C6 - C9	µg/L	20	150[4]			<20	<20	<20
C6-C10 less BTEX (F1)	mg/L	0.02		**NL**[6]		<0.02	<0.02	<0.02
C6-C10	mg/L	0.02				<0.02	<0.02	<0.02

Notes:

[1] ANZECC (2000) 95% of species protected – fresh water

[2] ANZECC (2000) 99% of species protected –fresh water

[3] NSW EPA (1994) Protection of aquatic ecosystems - fresh water

[4] Dutch (2000) groundwater intervention levels

[5] NHMRC 2011 Australian Drinking Water Guidelines

[6] NEPC (2013) Table 1 A(4) Groundwater HSLs for vapour intrusion –Commercial / Industrial, 2 to <4m, CLAY.

[7] Airports (Environment Protection) Regulations 1997 - Marine water

[8] Provisional USEPA Region 4 2009 Guideline (PFOS/PFOA) for drinking water

[9] Managing PFC Contamination at Airports, Interim Contamination Management Strategy and Decision Framework (GHD, June 2015)

[10] Aquatic predicted no-effect contentration (PNEC) for Perfluorooctane sulfonic acid, Qi et al 2011

[11] Ecological toxicity criterion for PFOA, Giesy et al 2010

[12] ANZECC (2000) 99% of species protected –marine

[13] ANZECC (2000) 95% of species protected – marine

Table C - Soil QA/QC

		Lab Reference	502800	502800	RPD	502800	EM1606429	RPD	502800	502800	RPD	502800	EM1606429	RPD	502800	502800	RPD	502800	EM1606429	RPD
		Sample ID	A1_TP19_0.0	A1-QC01		A1_TP19_0.0	A1-QC02		A1_TP16_0.0	A1-QC03		A1_TP16_0.0	A1-QC04		A1_TP13_0.4	A1-QC05		A1_TP13_0.4	A1-QC06	
		Date Sampled	30/05/2016	30/05/2016		30/05/2016	30/05/2016		30/05/2016	30/05/2016		30/05/2016	30/05/2016		30/05/2016	30/05/2016		30/05/2016	30/05/2016	
	Units	**EQL**																		
Heavy Metals																				
Arsenic	mg/kg	2 (Primary): 5 (Interlab)	5.1	6.2	19	5.1	6.0	16	4.4	7.3	50	4.4	9.0	69	<2.0	<2.0	0	<2.0	<5.0	0
Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	0.5	22	<0.4	<1.0	0	<0.4	<0.4	0	<0.4	<1.0	0	0.6	<0.4	40	0.6	<1.0	0
Chromium (III+VI)	mg/kg	5 (Primary): 2 (Interlab)	9.9	12.0	19	9.9	13.0	27	19.0	20.0	5	19.0	32.0	51	<5.0	<5.0	0	<5.0	<2.0	0
Copper	mg/kg	5	9.7	9.1	6	9.7	11.0	13	24.0	25.0	4	24.0	22.0	9	<5.0	<5.0	0	<5.0	<5.0	0
Lead	mg/kg	5	48.0	51.0	6	48.0	29.0	49	30.0	25.0	18	30.0	56.0	60	<5.0	<5.0	0	<5.0	<5.0	0
Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	5 (Primary): 2 (Interlab)	6.3	6.0	5	6.3	6.0	5	22.0	21.0	5	22.0	26.0	17	<5.0	<5.0	0	<5.0	<2.0	0
Zinc	mg/kg	5	21.0	20.0	5	21.0	20.0	5	45.0	34.0	28	45.0	48.0	6	<5.0	<5.0	0	<5.0	<5.0	0
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	0.6	<0.5	18	0.6	<0.5	18	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	1.2	<0.5	82	1.2	<0.5	82	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	**1.6**	**<0.5**	🟩 **105**	**1.6**	**<0.5**	🟩 **105**	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	1.8	0.6	100	1.8	0.6	100	0.6	0.6	0	0.6	0.6	0
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	2.1	1.2	55	2.1	1.2	55	1.2	1.2	0	1.2	1.2	0
Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	1.2	<0.5	82	1.2	<0.5	82	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	1.1	<0.5	75	1.1	<0.5	75	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	0.9	<0.5	57	0.9	<0.5	57	<0.5	<0.5	0	<0.5	<0.5	0
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	0.8	<0.5	46	0.8	<0.5	46	<0.5	<0.5	0	<0.5	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	1.0	<0.5	67	1.0	<0.5	67	<0.5	<0.5	0	<0.5	<0.5	0
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	0.9	<0.5	57	0.9	<0.5	57	<0.5	<0.5	0	<0.5	<0.5	0
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	**8.7**	**<0.5**	🟦 **178**	8.7	-	-	<0.5	<0.5	0	<0.5	-	-
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	1.0	<0.5	67	1.0	<0.5	67	<0.5	<0.5	0	<0.5	<0.5	0
TRH / BTEX																				
Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0
Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
TRH - Semivolatile Fraction																				
C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	180.0	<100.0	57	180.0	<100.0	57	<100.0	<100.0	0	<100.0	<100.0	0
C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0
C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	77.0	<50.0	43	77.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0
C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	**170.0**	**52.0**	🟩 **106**	170.0	<100.0	52	<50.0	<50.0	0	<50.0	<100.0	0
+C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	**247.0**	**52.0**	🟩 **130**	**247.0**	**<50.0**	🟩 **133**	<50.0	<50.0	0	<50.0	<50.0	0

Notes:

0 – 100% RPD (When the average concentration is < 5 times the LOR)	🟩
0 – 75% RPD (When the average concentration is 5 to 10 times the LOR)	🟦
0 – 50% RPD (When the average concentration is > 10 times the LOR)	🟧

Table D - Groundwater QA/QC

		Lab Reference	505193	505193	**RPD**
		Sample ID	A1 - GW1	A1 - QC07	
		Date Sampled	20/06/2016	20/06/2016	
	Units	**EQL**			
Dissolved Metals					
Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	0
Cadmium (Filtered)	mg/l	0.0001	0.0001	0.0001	0
Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0
Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0
Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
Nickel (Filtered)	mg/l	0.001	0.003	0.003	0
Zinc (Filtered)	mg/l	0.005	0.008	0.008	0
Perfluorinated Compounds (PFCs)					
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/l	0.00005	<0.00005	<0.00005	0
Perfluorooctanoate	mg/l	0.00001	<0.00001	<0.00001	0
PFOS	mg/l	0.00001	<0.00001	<0.00001	0
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	mg/l	0.00001	<0.00001	<0.00001	0
Acenaphthylene	mg/l	0.00001	<0.00001	<0.00001	0
Anthracene	mg/l	0.00001	<0.00001	<0.00001	0
Benz(a)anthracene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo(a) pyrene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo[b+j]fluoranthene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo(g,h,i)perylene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo(k)fluoranthene	mg/l	0.00001	<0.00001	<0.00001	0
Chrysene	mg/l	0.00001	<0.00001	<0.00001	0
Dibenz(a,h)anthracene	mg/l	0.00001	<0.00001	<0.00001	0
Fluoranthene	mg/l	0.00001	<0.00001	<0.00001	0
Fluorene	mg/l	0.00001	<0.00001	<0.00001	0
Indeno(1,2,3-c,d)pyrene	mg/l	0.00001	<0.00001	<0.00001	0
Naphthalene	mg/l	0.00001	<0.00001	<0.00001	0
PAHs (Sum of total)	mg/l	0.00005	<0.00005	<0.00005	0
Phenanthrene	mg/l	0.00001	<0.00001	<0.00001	0
Pyrene	mg/l	0.00001	<0.00001	<0.00001	0
TRH / BTEX					
Benzene	µg/l	1	<1.0	<1.0	0
Ethylbenzene	µg/l	1	<1.0	<1.0	0
Naphthalene	µg/l	10	<10.0	<10.0	0
Toluene	µg/l	1	<1.0	<1.0	0
Xylene (m & p)	µg/l	2	<2.0	<2.0	0
Xylene (o)	µg/l	1	<1.0	<1.0	0
Xylene Total	µg/l	3	<3.0	<3.0	0
C6 - C9	µg/l	20	<20.0	<20.0	0
C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
C6-C10	mg/l	0.02	<0.02	<0.02	0
TRH - Semivolatile Fraction					
C10-C16	mg/l	0.05	<0.05	<0.05	0
C16-C34	mg/l	0.1	<0.1	<0.1	0
C34-C40	mg/l	0.1	<0.1	<0.1	0
F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
C10 - C14	µg/l	50	<50.0	<50.0	0
C15 - C28	µg/l	100	<100.0	<100.0	0
C29-C36	µg/l	100	<100.0	<100.0	0
+C10 - C36 (Sum of total)	µg/l	100	<100.0	<100.0	0

Notes:

The acceptable range depends upon the levels detected:

0 – 100% RPD (When the average concentration is < 5 times the LOR)	🟩
0 – 75% RPD (When the average concentration is 5 to 10 times the LOR)	🟦
0 – 50% RPD (When the average concentration is > 10 times the LOR)	🟧

Appendix A – NEPM 2013 Ecological Investigation Limits Methodology

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NEPM 2013 Ecological Investigation Limits Methodology

Ecological investigation levels (EILs) for the protection of terrestrial ecosystems have been derived for common contaminants in soil based on a species sensitivity distribution (SSD) model developed for Australian conditions. EILs have been derived for As, Cu, CrIII, DDT, naphthalene, Ni, Pb and Zn.

EILs apply principally to contaminants in the top 2 metres of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species. In arid regions, where the predominant species may have greater root penetration, specific considerations may result in their application to 3 metres depth.

The methodology assumes that the ecosystem is adapted to the ambient background concentration (ABC) for the locality and that it is only adding contaminants over and above this background concentration which has an adverse effect on the environment.

The ABC of a contaminant is the soil concentration in a specified locality that is the sum of the naturally occurring background level and the contaminant levels that have been introduced from diffuse or non-point sources by general anthropogenic activity not attributed to industrial, commercial, or agricultural activities, for example, motor vehicle emissions.

The preferred method to determine the ABC is to measure the ABC at an appropriate reference site. This approach is essential in areas where there is a high naturally occurring background level such as will occur in mineralised areas.

An added contaminant limit (ACL) is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required. **The EIL is derived by summing the ACL and the ABC.**

ACLs are based on the soil characteristics of pH, CEC and clay content. Empirical relationships that can model the effect of these soil properties on toxicity are used to develop soil-specific values. These soil-specific values take into account the biological availability of the element in various soils. In this approach different soils will have different contaminant EILs rather than a single generic EIL for each contaminant.

The adopted soil characteristics (pH, clay content and cation exchange capacity) have been selected from sample A1_TP02_2.5 as the sample was considered to be representative of the primary soil type (silty clay) at the site and that the soils are unlikely to be impacted by anthropogenic sources due to the sample depth (2.4 m bgl).

Table 5.2: Calculating the ACL

ACLs	mg/kg								
	A1_TP02_2.5	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
pH	5.3								
CEC	12				190			290	420
% clay	48			660					
Generic	-					1800			

Information derived from **Table 1B(1)** *Soil-specific added contaminant limits for aged zinc in soils*, **Table 1B(2)** *Soil-specific added contaminant limits for aged copper in soils,* **Table 1B(3)** *Soil-specific added contaminant limits for aged chromium III and nickel in soils,* and **Table 1B(4)** *Generic added contaminant limits for lead in soils (commercial/industrial) irrespective of their physicochemical properties (NEPM 2013).*

Table 5.3: Calculating the ABC

ABC	mg/kg							
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
A1_TP02_2.5	n/a	n/a	10	8.7	10	n/a	5	5

Sample A1_TP02_2.5 (silty clay) was assumed to be representative of the 'background concentration' of the site due to the depth 2.4 m bgl, and that the clays at that depth are unlikely to be impacted by anthropogenic sources.

The EIL is derived by summing the ACL and the ABC.

Table 5.4: Calculating the EIL

EILs	mg/kg									
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	DDT	Naphth.
ABC + ACL			670 [3]	198.7 [3]	1810 [3]		295 [3]	425 [3]		
NEPM 2013	160 [1]								640 [1]	370 [1]
NEPM 1999		3 [2]				1 [2]				

[1] Generic EILs for aged arsenic, DDT and Naphthalene from **Table 1B(5)** for commercial/industrial land use**.**

[2] EILs from NEPM 1999 (no EILs specified for contaminants in NEPM 2013).

[3] EILs derived from NEPM 2013 equation ABC+ACL.

Appendix B – Borehole Logs

BOREHOLE No. A1-TP01

JACOBS

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 25/05/16 - 25/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass & Fill	RL:	Checked:

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP01_0.0	○			▩	FILL: Silty CLAY: (CL) brown, dry, very stiff, trace fine gravel, minor fine grained sands, minor rootlets, no odour.	VSt	D	
								▨	Silty CLAY: (CL) orange/brown mottled red/brown, dry, very stiff, minor rootlets, no odour.	VSt	D	
	0	A		A1-TP01_0.5	○			▨				
								▨	As above but red/brown mottled grey/brown, stiff, slightly moist and trace rootlets.	St	Sl. M	
	0	A		A1-TP01_1.0	○		1	▨				
									Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
							2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
→◀ ▶— = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP02

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP02_0.0	○			▨	FILL: Silty CLAY: (CL) brown and light grey, dry, very stiff, trace fine gravel, trace fine grained sands, minor rootlets, no odour.	VSt	D	
								▨	FILL: Silty SAND: (SM) very light brown and brown, dry, very dense, fine grained sands, some clay, no odour.	VD	D	
	0	A		A1-TP02_0.2	○			▨				
					▮			▧	Silty CLAY: (CL) brown and orange/brown, slightly moist, stiff to very stiff, trace fine grained sands, trace rootlets, no odour.	St - VSt	Sl. M	
	0	A		A1-TP02_0.3 - 0.8 A1-TP02_0.5	○			▧				pp (410, 430, 420)
								▧	Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, firm, no odour.	F	Sl. M	
							1	▧				
	0	A		A1-TP02_1.0	○			▧				pp (320, 290, 340)
								▧	As above.	F	Sl. M	
							2	▧				
	0	A		A1-TP02_2.0	○			▧				pp (290, 310, 320)
								▧	As above but soft to firm and trace fine grained sands.	S - F	Sl. M	
	0	A		A1-TP02_2.5	○			▧				pp (290, 280, 290)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◀ ▶ = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP03

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 25/05/16 - 25/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA								SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP03_0.0	○				FILL: Silty CLAY: (CL) light brown and brown, dry, very stiff, trace fine gravel, trace fine grained sands, minor rootlets and small to medium roots, no odour.	VSt	D	
									Silty CLAY: (CL) brown mottled orange/brown, dry, very stiff, minor rootlets, no odour.	VSt	D	
	0	A		A1-TP03_0.5	○							
									Silty CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, stiff, no odour.	St	Sl. M	
	0	A		A1-TP03_1.0	○			1				
									Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2				

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP04

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 26/05/16 - 26/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP04_0.0	○				FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine gravel, minor lead shot, trace fine grained sands, minor rootlets, no odour.	St	D	
									FILL: sandy Silty CLAY: (CL) light orange/brown, dry, very stiff, fine grained sands, no odour.	VSt	D	
									As above but light brown and brown.	VSt	D	
	0	A		A1-TP04_0.4	○							
									Silty CLAY: (CL) brown mottled orange/brown and dark brown, slightly moist, stiff, some fine grained sands, minor rootlets, no odour.	St	Sl. M	
	0	A		A1-TP04_0.6	○							pp (420, 440, 430)
									Silty CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, firm, no odour.	F	Sl. M	
							1					
	0	A		A1-TP04_1.0	○							pp (280, 300, 290)
									Sandy CLAY: (CL) grey mottled orange/brown, slightly moist, soft, fine grained sands, no odour.	S	Sl. M	
							2					
	0	A		A1-TP04_2.0	○							pp (200, 230, 220)
									As above but moist.	S	M	
	0	A		A1-TP04_2.5	○							pp (210, 230, 240)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP05

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 26/05/16 - 26/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP05_0.0	○				▩	FILL: Silty CLAY: (CL) dark brown, dry, very stiff, some fine to medium gravel, trace fine grained sands, no odour.	VSt	D	
	2	A		A1-TP05_0.3, A1-TP05_ASB_0.3	○				▩	Three fragments of asbestos observed and sampled.			
	2	A		A1-TP05_ASB_0.4	○				▩	Three fragments of abestos observed and sampled, a large piece of cermanic pipe observed.			
	1	A		A1-TP05_0.5	○				▩				
									▩	FILL: silty Clayey SAND: (SC) light brown and brown, dry, very dense, trace fine gravel, fine grained sands, no odour.	VD	D	
	0	A		A1-TP05_0.7	○				▩				
					█				▨	Silty CLAY: (CL) grey/brown mottled red/brown and brown, slightly moist, firm, minor rootlets, no odour.	F	Sl. M	
	0	A		A1-TP05_0.8 - 1.1	█			1	▨				
	0	A		A1-TP05_1.0	○				▨				pp (310, 340, 360)
									▨	As above but grey mottled orange/brown and red/brown, no rootlets.	F	Sl. M	
								2	▨				
	0	A		A1-TP05_2.0	○				▨				pp (280, 300, 300)
									▨	Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, soft to firm, some fine grained sands, no odour.	S - F	Sl. M	
	0	A		A1-TP05_2.5	○				▨				pp (280, 300, 300)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation,			
								3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP06

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP06_0.0	○				▩	FILL: Silty CLAY: (CL) grey/brown, dry, very stiff, minor fine gravel, trace fine grained sands, trace lead shot, minor rootlets, no odour.	VSt	D	
									▩	FILL: silty Sandy CLAY: (CL) very light brown, grey and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A1-TP06_0.3	○				▩				
									▨	Silty CLAY: (CL) brown, dry, stiff, trace rootlets, no odour.	St	D	
	0	A		A1-TP06_0.5	○				▨				
									▨	As above but grey mottled orange/brown and red/brown, slightly moist and firm.	F	Sl. M	
	0	A		A1-TP06_1.0	○			1	▨				
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP07

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP07_0.0	○				▦	FILL: Silty CLAY: (CL) grey/brown, dry, very stiff, minor small to medium aggregate and fragments of sandstone, some fine to medium gravel, trace lead shot, minor rootlets, no odour.	VSt	D	
									▦	FILL: silty Sandy CLAY: (CL) light brown and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A1-TP07_0.3	○								
									▨	Silty CLAY: (CL) brown mottled orange/brown, dry, very stiff, minor rootlets, no odour.	VSt	D	
	0	A		A1-TP07_0.5	○				▨				
									▨	As above but grey mottled red/brown and orange/brown, slightly moist and stiff.	St	Sl. M	
								1	▨				
	0	A		A1-TP07_1.0	○				▨				
									▨	Silty CLAY: (CL) grey mottled red/brown, slightly moist, frim, no odour.	F	Sl. M	
								2	▨				
	0	A		A1-TP07_2.0	○				▨				
									▨	As above but grey mottled red/brown and orange/brown.	F	Sl. M	
	0	A		A1-TP07_2.5	○				▨				
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◀ ▶ = Outflow / Inflow

FIELD DATA SYMBOLS
✕ = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP08

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP08_0.0	○				▩	FILL: Silty CLAY: (CL) grey/brown, dry, very stiff, some fine to medium gravel, trace lead shot, trace fine grained sands, minor rootlets, no odour.	VSt	D	
									▩	FILL: Silty CLAY: (CL) brown, dry, hard to very stiff, some fine to medium gravel, minor small to medium fragments of brick, concrete and asphalt, trace large pieces of ceramic pipe, no odour. Two fragments of asbestos observed and sampled.	H - VSt	D	
	1	A		A1-TP08_0.3	○				▩				
	2	A		A1-TP08_ASB_0.4	○				▩				
	2	A		A1-TP08_0.5	○				▩				
									▩	FILL: Silty SAND: (SM) very light brown, grey and brown, dry, dense, fine grained sands, some clay, no odour.	D	D	
	0	A		A1-TP08_0.8	○				▩				
								1	▧	Silty CLAY: (CL) grey/brown mottled orange/brown and red/brown, slightly moist, stiff, trace rootlets, no odour.	St	Sl. M	
	0	A		A1-TP08_1.0	○				▧				pp (410, 440, 410)
									▧	As above but grey mottled red/brown and orange/brown and firm.	F	Sl. M	
								2	▧				
	0	A		A1-TP08_2.0	○				▧				pp (340, 360, 350)
									▧	As above.	F	Sl. M	
	0	A		A1-TP08_2.5	○				▧				pp (320, 310, 310)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
—◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP09

Project: Contamination Investigation
Location: Bankstown Aiport - Site 1
Job No: IA110700
Client: Bankstown Airport Limited
Start - Finish Date: 26/05/16 - 26/05/16
Bore dia: 450 mm
Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass
Northings: mN
Eastings: mE
RL:
Logged: BC
Checked:

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP09_0.0	○				▨	FILL: Silty CLAY: (CL) dark brown, dry, stiff, minor fine gravel, trace small to medium fragments of sandstone, trace fine grained sands, minor rootlets, no odour.	St	D	
									▨	FILL: Silty CLAY: (CL) grey/brown and red/brown, dry, very stiff, minor fine to medium ironstone gravel, minor small fragments of concrete, sandstone and brick, no odour.	VSt	D	
	2 2	A A		A1-TP09_ASB_0.2 A1-TP09_0.2	○ ○				▨	Two fragments of asbestos observed and sampled.			
	2	A		A1-TP09_ASB_0.4	○				▨	Three fragments of asbestos observed and sampled.			
	2	A		A1-TP09_0.5	○				▨				
									▨	FILL: silty Sandy CLAY: (CL) brown and grey, dry, soft to firm, fine grained sands, no odour.	S - F	D	
	0	A		A1-TP09_0.7	○				▨				
									▧	Silty CLAY: (CL) brown mottled orange/brown, slightly moist, firm, minor rootlets. Medium tree root observed.	F	Sl. M	
	0	A		A1-TP09_1.0	○			1	▧				
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP10

Project: Contamination Investigation
Location: Bankstown Aiport - Site 1
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 26/05/16 - 26/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked:

FIELD DATA										SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP10_0.0	○				▩	FILL: Silty CLAY: (CL) brown/grey, dry, stiff, minor fine to medium gravel, minor fine to medium grained sands, minor rootlets, no odour.	St	D	
									▩	FILL: Silty CLAY: (CL) brown, grey/brown and orange/brown, dry, very stiff, minor fine gravel, trace fine ironstone gravel, minor fine grained sands, no odour.	VSt	D	
	0	A		A1-TP10_0.5	○								
									▩	FILL: silty Sandy CLAY: (CL) light brown and brown, dry, stiff, fine grained sands, no odour.	St	D	
	0	A		A1-TP10_0.9	○			1					
									▨	Silty CLAY: (CL) brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	
	0	A		A1-TP10_1.1	○								pp (480, 470, 510)
									▨	As above but grey/brown mottled red/brown and orange/brown, firm, no rootlets	F	Sl. M	
								2					
	0	A		A1-TP10_2.0	○								pp (300, 300, 280)
									▨	Silty CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, firm, no odour.	F	Sl. M	
	0	A		A1-TP10_2.5	○								pp (320, 330, 290)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►― = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP11

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP11_0.0	○				FILL: gravelly Silty CLAY: (CL) brown, dry, very stiff, fine to medium gravel, trace small fragments of sandstone and small aggregate, trace fine grained sands, minor rootlets, no odour.	VSt	D	
	2	A		A1-TP11_0.3	○				FILL: silty Clayey GRAVEL: (GC) grey, dry, very dense, fine to medium gravel, aggegrate and fragments of asphalt, minor small to medium fragments of concrete and sandstone, no odour.	VD	D	
	2	A		A1-TP11_ASB_0.3	○							
	2	A		A1-TP11_ASB_0.4	○				One fragment of asbestos observed and sampled. Large pieces of brick, wood and concrete observed.			
	2	A		A1-TP11_0.5	○				One fragment of asbestos observed and sampled.			
	2	A		A1-TP11_0.4 - 0.8	▌				FILL: clayey Silty SAND: (SM) grey, dry, dense, fine grained sands, no odour.	D	D	
	0	A		A1-TP11_0.7	○							
									Silty CLAY: (CL) grey/brown mottled orange/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	pp (540, 530, 520)
							1					
	0	A		A1-TP11_1.0	○				As above but grey mottled orange/brown and red/brown.	VSt	Sl. M	
												PP (510, 490, 490)
									As above but firm to stiff and no rootlets.	F - St	Sl. M	
							2					
	0	A		A1-TP11_2.0	○							PP (330, 320, 360)
	0	A		A1-TP11_2.5	○							PP (380, 420, 410)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▌ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP12

Project: Contamination Investigation
Location: Bankstown Aiport - Site 1
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 26/05/16 - 26/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked:

	FIELD DATA								SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP12_0.0	○			▩	FILL: gravelly Silty CLAY: (CL) grey/brown, dry, stiff, fine to medium gravel, trace large pieces of asphalt and ceramic pipe, minor small to medium pieces of sandstone, some fine grained sands, minor rootlets, no odour.	St	D	
								▩	FILL: Silty CLAY: (CL) grey, brown and red/brown, dry, very stiff, some fine to medium gravel, minor small to medium fragments of sandstone and ironstone, trace medium to large pieces of ceramic tile, minor rootlets, no odour.	VSt	D	
	2	A		A1-TP12_ASB_0.4	○				One fragment of asbestos observed and sampled.			
	2	A		A1-TP12_0.5	○							
								▩	FILL: Silty SAND: (SM) very light brown and brown, dry, dense, trace fine gravel, fine grained sands, some clay, no odour.	D	D	
	0	A		A1-TP12_0.8	○							
							1	▨	Silty CLAY: (CL) brown mottled orange/brown, dry, very stiff, minor rootlets, no odour.	VSt	D	
	0	A		A1-TP12_1.0	○							pp (480, 490, 490)
									As above but grey mottled red/brown and orange/brown, slightly moist, stiff, no rootlets.	St	Sl. M	
							2					
	0	A		A1-TP12_2.0	○							pp (380, 400, 410)
									As above.	St	Sl. M	
	0	A		A1-TP12_2.5	○							pp (370, 400, 380)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◀ ▶ = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP13

Project: Contamination Investigation
Location: Bankstown Aiport - Site 1
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 30/05/16 - 30/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked:

FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP13_0.0	○			▦	FILL: Silty CLAY: (CL) dark brown, dry, very stiff, minor fine gravel, minor fine grained sands, minor rootlets, no odour.	VSt	D	
	0	A		A1-TP13_0.4, A1-QC05, A1-QC06	○			▦	FILL: clayey Silty SAND: (SM) very light brown and brown, dry, compact, fine grained sands, no odour.	CO	D	
								▨	Sandy CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, very stiff, fine to medium grained sands, no odour.	VSt	Sl. M	
							1	▨				
	0	A		A1-TP13_1.0	○			▨				pp (550, 520, 530)
								▨	Silty CLAY: (CL) grey mottled red/brown, slightly moist, stiff, trace fine grained sands, no odour.	St	Sl. M	
							2	▨				
	0	A		A1-TP13_2.0	○			▨				pp (420, 450, 430)
								▨	As above but grey mottled orange/brown and red/brown.	St	Sl. M	
	0	A		A1-TP13_2.5	○			▨				pp (430, 450, 450)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
—◀ ▶— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP14

Project: Contamination Investigation
Location: Bankstown Aiport - Site 1
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 26/05/16 - 26/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked:

FIELD DATA									SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	2	A		A1-TP14_0.0	○					FILL: Silty CLAY: (CL) grey/brown, dry, very stiff, some fine to medium gravel, minor rootlets, no odour.	VSt	D	
	2	A		A1-TP14_ASB_0.2	○					Two fragments of asbestos observed and sampled. Trace whole brick and large fragments of concrete observed.			
										FILL: gravelly Silty CLAY: (CL) brown, dry, hard, fine to medium gravel, minor fine ironstone gravel, minor smal to medium fragments of ironstone and asphalt, no odour.	H	D	
	1	A		A1-TP14_0.5	○								
										FILL: Silty SAND: (SM) very light brown and brown, dry, dense, fine grained sands, some clay, no odour.	D	D	
										Silty CLAY: (CL) brown mottled orange/brown, slightly moist, stiff, minor rootlets, no odour.	St	Sl. M	
								1					
	0	A		A1-TP14_1.0	○								pp (330, 300, 330)
										As above but grey mottled red/brown, firm to stiff, no rootlets.	F - St	Sl. M	
								2					
	0	A		A1-TP14_2.0	○								pp (280, 300, 270)
										As above.	F - St	Sl. M	
	0	A		A1-TP14_2.5	○								pp (340, 330, 320)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A1-TP15

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 26/05/16 - 26/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP15_0.0					▨	FILL: Silty CLAY: (CL) grey/brown, dry, very stiff, some fine to medium gravel, trace large pieces of ceramic pipe, minor small to medium fragments of sandstone, trace fine grained sands, minor rootlets, no odour.	VSt	D	
	2	A		A1-TP15_ASB_0.2					▨	One fragment of asbestos observed and sampled.			
									▨	FILL: Silty CLAY: (CL) brown, dry, hard, some fine to medium gravel, minor small to medium fragments of sandstone, asphalt and concrete, trace fine ironstone gravel, minor fine grained sands, no odour. Large pieces of steel pipe observed.	H	D	
	1	A		A1-TP15_0.5					▨				
									▨	FILL: Silty SAND: (SM) very light brown and brown, dry, dense, fine grained sands, some clay, no odour.	D	D	
	0	A		A1-TP15_0.8					▨				
									▧	Silty CLAY: (CL) orange/brown mottled brown, slightly moist, very stiff to stiff, minor rootlets, no odour.	VSt - St	Sl. M	
	0	A		A1-TP15_1.0				1	▧				
										Test Pit terminated at 1.2 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP16

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 30/05/16 - 30/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA								SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A1-TP16_0.0, A1-QC03, A1-QC04	○				FILL: gravelly Silty CLAY: (CL) dark grey/brown, dry, very stiff, fine to medium gravel, minor smal to medium fragments of sandstone, asphalt, brick and concrete, minor fine to medium grained sands, minor rootlets, no odour.	VSt	D	
									As above but grey/brown and brown, trace large pieces of brick, sandstone and concrete	VSt	D	
	1	A		A1-TP16_0.5	○							
	0	A		A1-TP16_0.8	○				FILL: clayey Silty SAND: (SM) very light brown and brown, dry, compact, fine grained sands, no odour.	CO	D	
							1		Silty CLAY: (CL) brown and dark brown, slightly moist, very stiff, minor rootlets, trace medium to large roots, no odour.	VSt	Sl. M	
	0	A		A1-TP16_1.0	○							pp (510, 500, 500)
									Silty CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, stiff, no odour.	St	Sl. M	
									As above but grey mottled red/brown.	St	Sl. M	
							2					
	0	A		A1-TP16_2.0	○							pp (460, 420, 430)
									As above.	St	Sl. M	
	0	A		A1-TP16_2.5	○							pp (480, 460, 460)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP17

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA						SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP17_0.0	○		▩	FILL: Silty CLAY: (CL) dark brown, dry, very stiff, minor fine gravel, minor fine to medium grained sands, minor rootlets, no odour.	VSt	D	
	0	A		A1-TP17_0.5	○		▨	Silty CLAY: (CL) brown, dry, stiff, some fine grained sands, trace rootlets, no odour.	St	D	
	0	A		A1-TP17_1.0	○	1	▨	Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, firm to stiff, some fine to medium grained sands, no odour.	F - St	Sl. M	
						2		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

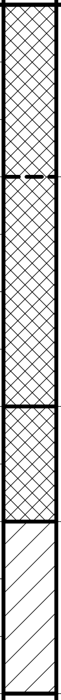
CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP18

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 27/05/16 - 27/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:



	FIELD DATA							SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP18_0.0	○			FILL: Silty CLAY: (CL) grey/brown, dry, stiff, some fine gravel, minor rootlets, no odour.	St	D	
								FILL: Silty CLAY: (CL) brown, dry, very stiff, minor fine gravel, trace fine ironstone gravel, no odour.	VSt	D	
	0	A		A1-TP18_0.5	○						
								FILL: clayey Silty SAND: (SM) very light brown and brown, dry, dense, fine grained sands, no odour.	D	D	
	0	A		A1-TP18_0.8	○						
								Silty CLAY: (CL) brown mottled orange/brown and dark brown, slightly moist, firm, trace rootlets, no odour.	F	Sl. M	
						1					
	0	A		A1-TP18_1.0	○						
								Test Pit terminated at 1.2 m bgl. Limit of Investigation.			
						2					

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP19

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 30/05/16 - 30/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP19_0.0, A1-QC01, A1-QC02	○					FILL: Silty CLAY: (CL) dark brown, dry, stiff, minor fine gravel, minor fine grained sands, some rootlets, no odour.	St	D	
										FILL: clayey Silty SAND: (SM) very light brown and brown, dry, compact, fine grained sands, no odour.	CO	D	
	0	A		A1-TP19_0.3	○								
	0	A		A1-TP19_0.5	○								
										Sandy CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, very stiff, fine grained sands, no odour.	VSt	Sl. M	
	0	0		A1-TP19_0.7 - 1.1	▌								
	0	A		A1-TP19_1.0	○			1					pp (490, 520, 510)
										Silty CLAY: (CL) grey mottled red/brown, slightly moist, stiff, no odour.	St	Sl. M	
	0	A		A1-TP19_2.0	○			2					pp (420, 440, 440)
										As above but grey mottled red/brown and orange/brown.	St	Sl. M	
	0	A		A1-TP19_2.5	○								pp (370, 370, 360)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▌ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A1-TP20

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Aiport - Site 1	Start - Finish Date: 30/05/16 - 30/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked:

	FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A1-TP20_0.0	○				▩	FILL: Silty CLAY: (CL) dark brown, dry, stiff, minor fine gravel, minor fine grained sands, minor rootlets, no odour.	St	D	
									▩	FILL: Silty CLAY: (CL) grey/brown and grey, dry, hard to very stiff, some fine to medium gravel, minor small fragments of sandstone, trace large pieces of sandstone, minor fine grained sands, no odour.	H - VSt	D	
	1	A		A1-TP20_0.5	○				▩				
	0	A		A1-TP20_0.8	○				▩	FILL: clayey Silty SAND: (SM) very light brown and brown, dry, compact, fine grained sands, no odour.	CO	D	
								1					
									▨	Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, very stiff, trace fine grained sands, minor rootlets, no odour.	VSt	Sl. M	
	0	A		A1-TP20_1.1	○				▨				pp (530, 520, 510)
									▨	As above but stiff.	St	Sl. M	
									▨	As above but firm to soft.	F - S	Sl. M	
								2	▨				
	0	A		A1-TP20_2.0	○				▨				pp (260, 260, 280)
									▨	As above but trace fine ironstone gravel and small fragments of highly weathered ironstone.	F - S	Sl. M	
	0	A		A1-TP20_2.5	○				▨				pp (320, 300, 300)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH1
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 24/5/16
DATE COMPLETED : 24/5/16
DATE LOGGED : 24/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA					0.0 – 0.30m		Silty SAND: pale grey, fine to medium grained sand, trace of clay, fine to medium gravel and rootlets	D		FILL
				0.50m SPT 3,5,4 N=9 0.95m	0.30m – 0.90m	CI-CH	Silty CLAY: red-brown, grey, medium to high plasticity, trace of rootlets	D - M	St	ALLUVIUM
AD/T		VE		1.50m SPT 4,5,6 N=11 1.95m 3.00m SPT 3,5,5 N=10 3.45m 4.50m SPT 3,5,6 N=11 4.95m 6.00m SPT 4,5,7 N=12 6.45m	0.90m – 7.00m	CH	Silty CLAY: grey, brown, high plasticity At 4.0m, as above but trace of ironstone gravel	M		
		E	▽		7.00m – 7.50m	SC	Clayey SAND: red-brown, grey, medium to coarse grained sand, with ironstone gravel		MD	
				7.50m SPT 5,12,14 N=26 7.95m	7.50m – 8.0	SC	Clayey SAND: grey, medium to coarse grained sand			

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH1
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 24/5/16
DATE COMPLETED : 24/5/16
DATE LOGGED : 24/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E			8.0		SC	Clayey SAND: grey, medium to coarse grained sand *(continued)* 8.50m	M	MD	ALLUVIUM
		VE		9.50m SPT 4,6,10 N=16 9.95m	9.0		CH	Silty CLAY: red-brown, grey, high plasticity, trace of ironstone gravel 9.95m		St	
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH2
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING

PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)
HA		VE	Not Observed		0.0
AD/T				0.50m SPT 3,4,4 N=8 0.95m	
					1.0
				1.50m SPT 3,6,9 N=15 1.95m	
				2.00m U 2.40m	2.0
				3.00m SPT 3,6,7 N=13 3.45m	3.0
					4.0
				4.50m SPT 3,5,8 N=13 4.95m	
					5.0
				6.00m SPT 3,6,8 N=14 6.45m	6.0
		E			7.0
				7.50m SPT 4,6,10 N=16 7.95m	
					8.0

MATERIAL

DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
0.0 – 0.40m		Silty CLAY: pale grey, low plasticity, with fine grained sand, trace of fine to medium gravel and rootlets	D		FILL
0.40 – 0.80m		Silty CLAY: brown, medium to high plasticity, trace of fine to medium gravel and rootlets	D - M		
0.80 – 8.0	CH	Silty CLAY: grey, brown, high plasticity, trace of ironstone gravel From 4.5-5.0m, as above but trace of fine grained sand	M	St	ALLUVIUM

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH2
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD

DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE	Not Observed	9.50m SPT 4,5,7 N=12 9.95m	8.0 9.0		CH	Silty CLAY: grey, brown, high plasticity, trace of ironstone gravel *(continued)* 9.95m	M	St	ALLUVIUM
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH3
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 26/5/16
DATE COMPLETED : 26/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA		VE	Not Observed		0.0			Gravelly CLAY: brown, low plasticity, fine to medium gravel, with fine grained sand and rootlets	D		FILL
					0.30m			Silty CLAY: brown, medium plasticity, trace of organics	D - M		
AD/T				0.50m SPT 3,3,4 N=7 0.95m							
					0.90m		CH	Silty CLAY: grey, brown, high plasticity	M	F	ALLUVIUM
					1.0						
				1.50m SPT 3,7,10 N=17 1.95m						St - VSt	
					2.0						
				3.00m SPT 4,6,11 N=17 3.45m	3.0						
					4.0						
				4.50m SPT 3,6,9 N=15 4.95m							
					5.0						
				6.00m SPT 3,5,9 N=14 6.45m	6.0						
					7.0						
		E		7.50m SPT 5,10,11 N=21 7.95m				At 7.5m, as above but trace of ironstone gravel		VSt	
					8.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH3
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD

DATE STARTED : 26/5/16
DATE COMPLETED : 26/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E VE	Not Observed	9.50m SPT 3,7,10 N=17 9.95m	8.0 9.0		CH	Silty CLAY: grey, brown, high plasticity *(continued)* 9.95m	M	VSt	ALLUVIUM
					10.0 11.0 12.0 13.0 14.0 15.0 16.0			End of borehole at 9.95m, target depth			

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH4
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 24/5/16
DATE COMPLETED : 24/5/16
DATE LOGGED : 24/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA		VE			0.0			Silty CLAY: pale grey, low plasticity, with medium gravel, fine grained sand, trace of rootlets	D		FILL
AD/T				0.50m SPT 2,3,3 N=6 0.95m	0.20m		CI-CH	Silty CLAY: brown, grey, medium plasticity, trace of rootlets At 1.0m, as above but clay is high plasticity	D - M M	F	ALLUVIUM
				1.50m SPT 4,6,7 N=13 1.95m	1.50m		CH	Silty CLAY: grey, red-brown, high plasticity, trace of fine grained sand	M	St	
				3.00m SPT 3,4,6 N=10 3.45m 4.50m SPT 3,5,9 N=14 4.95m 6.00m SPT 4,6,8 N=14 6.45m	3.00m		CH	Silty CLAY: grey, brown, high plasticity	M	St	
		E	▽	7.50m SPT 6,9,21 N=30 7.95m	7.00m		SC	Clayey SAND: grey, brown, medium to coarse grained sand, trace of ironstone gravel	M	MD - D	7.50: SPT bouncing
					8.0						

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH4
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 24/5/16
DATE COMPLETED : 24/5/16
DATE LOGGED : 24/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E			8.0		SC	Clayey SAND: grey, brown, medium to coarse grained sand, trace of ironstone gravel *(continued)* 8.50m	M - W	MD - D	ALLUVIUM
		VE		9.50m SPT 4,7,11 N=18 9.95m	9.0		CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel 9.95m	M	VSt	
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH5
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD

DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL				
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA		H	Not Observed		0.0		Silty CLAY: brown, low plasticity, with fine to coarse gravel and rootlets	D		FILL
		E								
					0.45m		Silty SAND: pale grey, fine grained sand, trace of clay and rootlets			
AD/T		VE		0.50m SPT 5,8,9 N=17 0.95m						
					0.80m		Silty CLAY: brown, red-brown, medium plasticity, trace of fine gravel	D - M		
					1.00m	CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel	M	St	ALLUVIUM
				1.50m SPT 2,4,7 N=11 1.95m	2.0					
				3.00m SPT 3,6,8 N=14 3.45m	3.00m	CH	Silty CLAY: grey, high plasticity			
					4.0					
				4.50m SPT 3,6,11 N=17 4.95m					VSt	
					5.0					
				6.00m SPT 3,6,8 N=14 6.45m	6.0				St	
							From 6.5-7.5m, as above but with ironstone gravel			
					7.0					
				7.50m SPT 4,5,9 N=14 7.95m	8.0					

See Explanatory Notes for details of abbreviations & basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH5
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
AD/T		VE	Not Observed		8.0		CH	Silty CLAY: grey, high plasticity *(continued)*	M	St	ALLUVIUM
					9.0						
				9.50m SPT 3,6,9 N=15 9.95m				9.95m			
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for details of abbreviations & basis of descriptions.

SKM LIB 1.01.2 GLB Log IS AU BOREHOLE 2 IA110700 GINT.GPJ <<DrawingFile>> 14/06/2016 18:16 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: SKM 1.01.2 2013-10-17 Prj: SKM 1.01.1 2013-10-16

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH6
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD

DATE STARTED : 26/5/16
DATE COMPLETED : 26/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING

DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS
HA (0.0 m)		VE (0.0–6.5 m)	Not Observed	0.50m SPT 6,8,8 N=16 0.95m
AD/T (to 8.0 m)				1.50m SPT 2,4,5 N=9 1.95m
				3.00m SPT 4,9,11 N=20 3.45m
				4.50m SPT 4,8,11 N=19 4.95m
				6.00m SPT 4,7,9 N=16 6.45m
		E (6.5–8.0 m)		7.50m SPT 4,7,10 N=17 7.95m

MATERIAL

DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
0.0–0.60m		Silty CLAY: brown, low plasticity, with fine to medium gravel and rootlets	D		FILL
0.60m–0.80m		Silty SAND: pale grey, fine grained sand, trace of fine to medium gravel and clay	D - M		
0.80m–1.10m		Silty CLAY: brown, medium plasticity, trace of rootlets			
1.10m–4.50m	CH	Silty CLAY: grey, brown, high plasticity	M	St (to 3.0)	ALLUVIUM
4.50m–6.00m	CH	Silty CLAY: grey, red-brown, high plasticity, with ironstone gravel		VSt (from 3.0)	
6.00m–8.0	CH	Silty CLAY: grey, brown, high plasticity			

See Explanatory Notes for details of abbreviations & basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH6
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 26/5/16
DATE COMPLETED : 26/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E	Not Observed	9.50m	8.0 9.0		CH	Silty CLAY: grey, brown, high plasticity *(continued)*	M	VSt	ALLUVIUM
				SPT 3,6,9 N=15 9.95m				9.95m		St	
					10.0 11.0 12.0 13.0 14.0 15.0 16.0			End of borehole at 9.95m, target depth			

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS®

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH7
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING: PROGRESS: DRILLING & CASING	DRILLING: PROGRESS: WATER	DRILLING: DRILLING PENETRATION	DRILLING: GROUND WATER LEVELS	DRILLING: SAMPLES & FIELD TESTS	DEPTH (m)	MATERIAL: CLASSIFICATION SYMBOL	MATERIAL: MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MATERIAL: MOISTURE CONDITION	MATERIAL: CONSISTENCY RELATIVE DENSITY	MATERIAL: STRUCTURE & Other Observations
HA		E	Not Observed		0.0 – 0.35m		Gravelly CLAY: brown, low plasticity, fine to medium gravel, with rootlets, trace of debris (wood fragments)	D		FILL
		VE		0.50m SPT 4,6,7 N=13 0.95m	0.35m – 0.90m	CI	Silty CLAY: grey, brown, medium plasticity, trace of rootlets	D - M	St	ALLUVIUM
AD/T				1.50m SPT 3,3,6 N=9 1.95m 3.00m SPT 3,3,6 N=9 3.45m 4.50m SPT 3,5,6 N=11 4.95m	0.90m – 5.50m	CH	Silty CLAY: grey, brown, high plasticity	M		
				6.00m SPT 4,6,8 N=14 6.45m 7.50m SPT 4,6,9 N=15 7.95m	5.50m – 8.0	CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel			

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : A1-BH7
FILE / JOB NO : IA110700
SHEET : 2 OF 2

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE	Not Observed		8.0		CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel *(continued)*	M	St	ALLUVIUM
				9.50m SPT 5,9,12 N=21 9.95m	8.50m 9.0		CH	Silty CLAY: grey, brown, high plasticity, with ironstone gravel, trace of sand		VSt	
					9.95m 10.0 11.0 12.0 13.0 14.0 15.0 16.0			End of borehole at 9.95m, target depth			

See Explanatory Notes for details of abbreviations & basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH8
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA		E	Not Observed		0.0			Gravelly CLAY: brown, low plasticity, fine to medium gravel, with rootlets 0.30m	D		FILL
				0.50m SPT 4,10,7 N=17				Silty CLAY: brown, low to medium plasticity, trace of rootlets and black vitreous material 0.70m	M		
AD/T		VE		0.95m				Silty SAND: pale grey, fine grained sand, trace of clay 1.00m	D		
				1.50m SPT 2,4,6 N=10 1.95m	1.0		CI	Silty CLAY: brown, medium plasticity At 1.5, as above but trace of rootlets 1.70m	D - M	St	ALLUVIUM
				2.00m U 2.50m 3.00m SPT 4,6,10 N=16 3.45m 4.50m SPT 3,6,7 N=13 4.95m 6.00m SPT 3,5,8 N=13 6.45m 7.50m SPT 3,5,7 N=12 7.95m	2.0 3.0 4.0 5.0 6.0 7.0 8.0		CH	Silty CLAY: grey, red-brown, high plasticity	M		

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS®

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH8
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 25/5/16
DATE COMPLETED : 25/5/16
DATE LOGGED : 25/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
AD/T		VE	Not Observed	9.50m SPT 4,5,9 N=14 9.95m	8.0 9.0		CH	Silty CLAY: grey, red-brown, high plasticity *(continued)*	M	St	ALLUVIUM
					9.95m						
					10.0 11.0 12.0 13.0 14.0 15.0 16.0			End of borehole at 9.95m, target depth			

See Explanatory Notes for details of abbreviations & basis of descriptions.

SKM LIB 1.01.2.GLB Log IS AU BOREHOLE 2 IA110700 GINT.GPJ <<DrawingFile>> 14/06/2016 18:16 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: SKM 1.01.2 2013-10-17 Prj: SKM 1.01.1 2013-10-16

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH9
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 26/5/16
DATE COMPLETED : 26/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA					0.0		Silty CLAY: brown, low plasticity, with fine to medium gravel and rootlets At 0.4m, as above but clay is medium plasticity	D D - M		FILL
AD/T			Not Observed	0.50m SPT 6,10,7 N=17 0.95m	0.60m		Silty SAND: pale grey, fine grained sand, trace of fine to medium gravel and clay	D - M		
					0.80m		Silty CLAY: brown, medium plasticity, trace of rootlets	D - M		
				1.50m SPT 2,4,5 N=9 1.95m	1.20m	CH	Silty CLAY: brown, red-brown, high plasticity	M	St	ALLUVIUM
				3.00m SPT 3,7,11 N=18 3.45m 4.50m SPT 3,6,8 N=14 4.95m 6.00m SPT 3,6,8 N=14 6.45m 7.50m SPT 3,6,10 N=16 7.95m	2.50m	CH	Silty CLAY: grey, brown, high plasticity, trace of ironstone gravel	M	VSt St	
					8.0					

See Explanatory Notes for details of abbreviations & basis of descriptions.

SKM LIB 1.01.2 GLB Log IS AU BOREHOLE 2 IA110700 GINT.GPJ <<DrawingFile>> 14/06/2016 18:16 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: SKM 1.01.2 2013-10-17 Prj: SKM 1.01.1 2013-10-16

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH9
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 26/5/16
DATE COMPLETED : 26/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
AD/T			Not Observed		8.0		CH	Silty CLAY: grey, brown, high plasticity, trace of ironstone gravel *(continued)*	M	St	ALLUVIUM
					9.0						
				9.50m SPT 3,7,10 N=17						VSt	
				9.95m				9.95m			
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH10
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD

DATE STARTED : 26/5/16
DATE COMPLETED : 30/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
HA					0.0			Silty CLAY: brown, low plasticity, with rootlets, trace of fine to medium gravel and fine grained sand	D		FILL
AD/T				0.50m SPT 4,7,14 N=21 0.95m				0.40m Silty CLAY: brown, low plasticity, trace of fine to medium gravel and rootlets	D - M		
					1.0			0.80m Silty SAND: pale grey, fine to medium grained sand	D		
				1.50m SPT 3,5,6 N=11 1.95m	2.0		CI-CH	1.20m Silty CLAY: grey, brown, medium plasticity At 1.8m, as above but clay is high plasticity	M	St	ALLUVIUM
				3.00m SPT 4,8,10 N=18 3.45m	3.0 4.0		CH	3.00m Silty CLAY: grey, red-brown, high plasticity, with ironstone gravel, trace of sand		VSt	
				4.50m SPT 4,6,8 N=14 4.95m	5.0					St	
			▽	6.00m SPT 4,5,11 N=16 6.45m	6.0		CH	5.00m Silty CLAY: grey, brown, high plasticity			
							SC	6.30m Clayey SAND: grey, brown, medium to coarse grained sand		MD	
				7.50m SPT 4,7,11 N=18 7.95m	7.0 8.0		CH	6.80m Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel		VSt	

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 1

HOLE NO : A1-BH10
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : BD
DATE STARTED : 26/5/16
DATE COMPLETED : 30/5/16
DATE LOGGED : 26/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T					8.0		CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel *(continued)*	M	VSt	ALLUVIUM
					9.0						
				9.50m SPT 3,5,8 N=13						St	
				9.95m				9.95m			
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

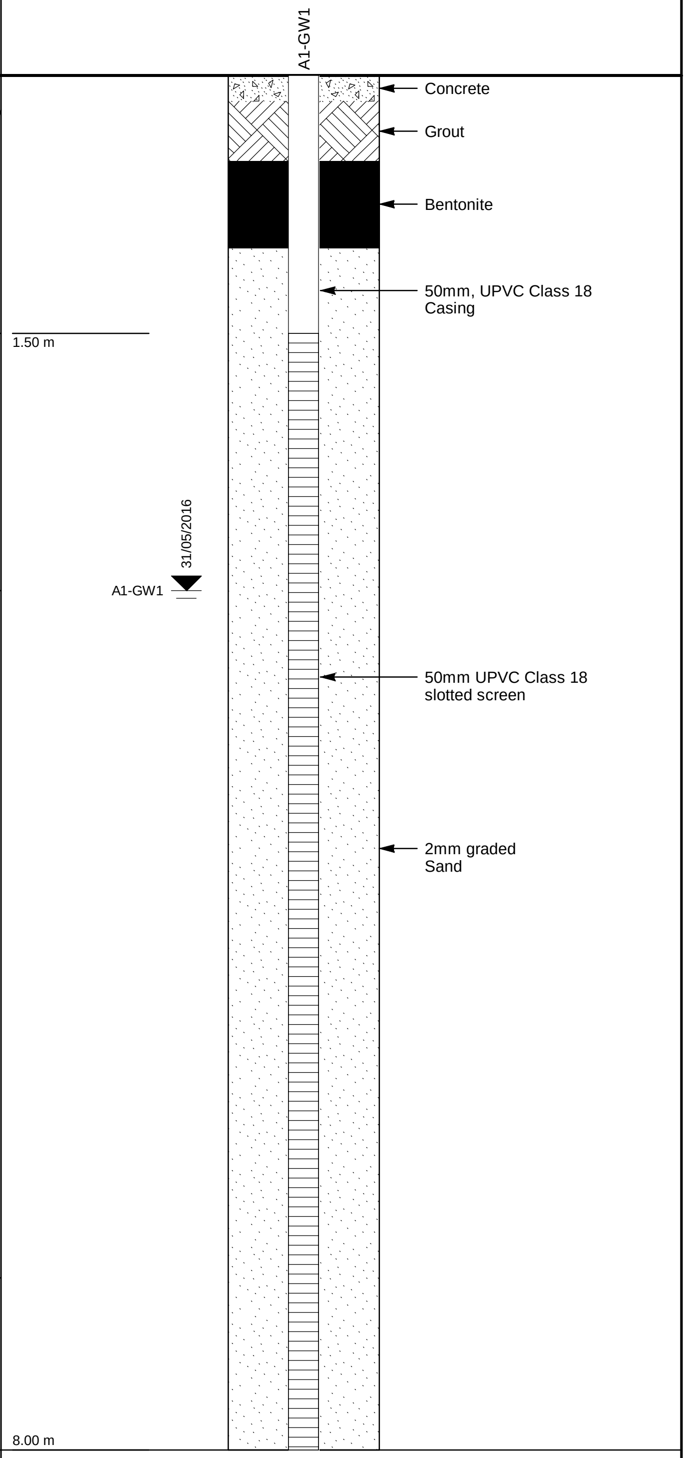
Hole ID **A1-GW1**

CLIENT	: Bankstown Airport Limited	POSITION	: Site 1	SHEET	: 1 OF 1
CONTRACTOR	: Epoca Environmental	EASTING	:	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	:	LOGGED BY	: MG
LOCATION	: Bankstown Airport	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 30/05/2016 - 31/05/2016
PROJECT No.	: IA110700	GROUND RL	:		

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T					Silty CLAY: pale grey, low plasticity, with medium gravel and fine grained sand, trace of rootlets, dry (fill)
					Silty CLAY: brown, grey, medium plasticity, trace of rootlets, dry to moist, firm (alluvium)
		1			At 1.0m, as above but clay is high plasticity, moist
		2			Silty CLAY: grey, brown, high plasticity, trace of fine grained sand, moist, stiff (alluvium)
		3 4 5 6			Silty CLAY: grey, brown, high plasticity, moist, stiff (alluvium)
	▽	7			Clayey SAND: grey, brown, medium to coarse grained sand, trace of ironstone gravel, remoulds to clayey sand, moist, medium dense to dense (alluvium)
		8			End of borehole at 8.0m, target depth

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
A1-GW1	Standpipe Piezometer		8.00 m	31/05/2016	



RIG	:	CHECKED BY	: JK
INCLINATION	:	CHECKED DATE	: 09/06/2016
AZIMUTH	:	APPROVED BY	: SR
HOLE DIA.	:	APPROVED DATE	:

REMARK

JACOBS

Hole ID **A1-GW2**

CLIENT : Bankstown Airport Limited
CONTRACTOR : Epoca Environmental
PROJECT : Geotechnical Investigation
LOCATION : Bankstown Airport
PROJECT No. : IA110700

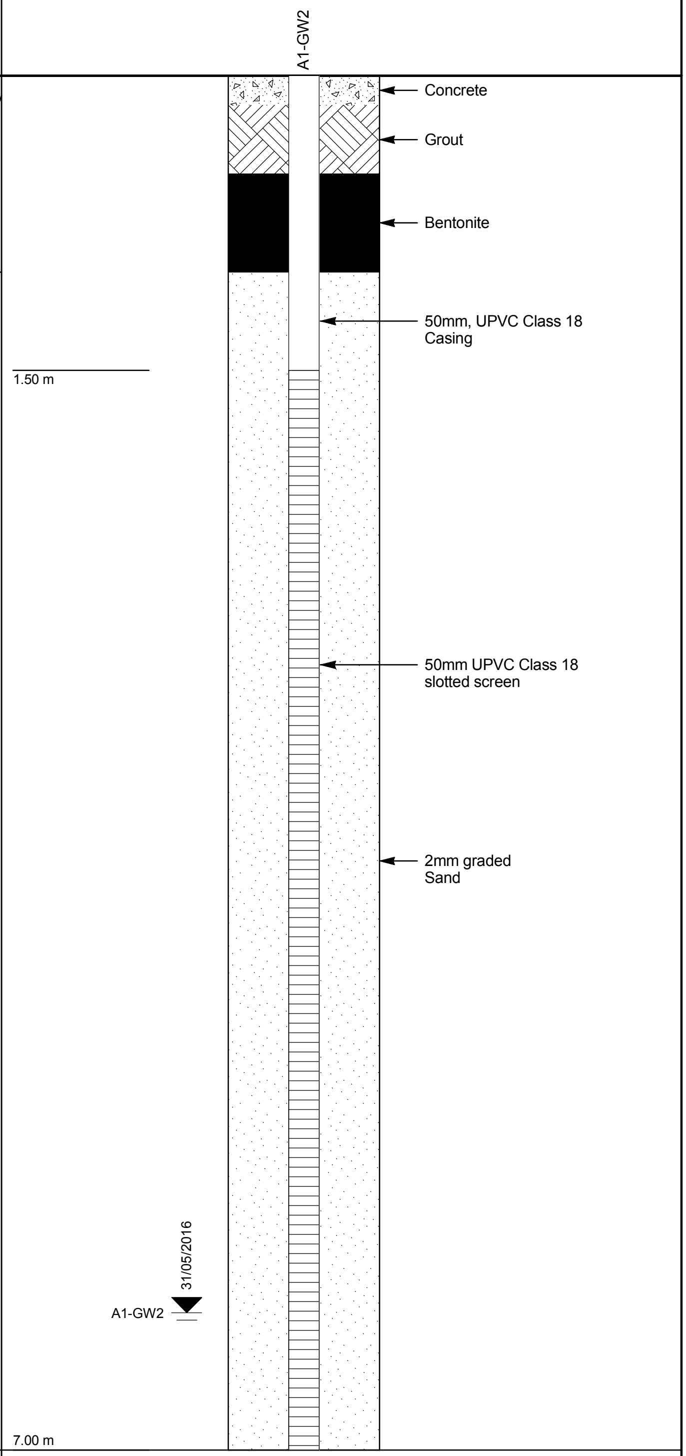
POSITION : Site 1
EASTING :
NORTHING :
COORD. SYS. : MGA94 Zone 56
GROUND RL :

SHEET : 1 OF 1
STATUS :
LOGGED BY : MG
DRILL DATE : 30/05/2016 - 31/05/2016

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T					Silty CLAY: brown, low plasticity, trace of rootlets, dry (topsoil)
					Silty CLAY: grey, brown, medium plasticity, moist (alluvium)
		1			Silty CLAY: grey, red-brown, high plasticity, moist (alluvium)
		2			At 2.0m, as above but grey, brown
		3			From 3.0-3.5m, as above but red-brown, with ironstone gravel
		4			At 4.2m, as above but trace of ironstone gravel
		5			
		6			
		7			End of borehole at 7.0m, target depth

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
A1-GW2	Standpipe Piezometer		7.00 m	31/05/2016	



RIG :
INCLINATION :
AZIMUTH :
HOLE DIA. :

CHECKED BY : JK
CHECKED DATE : 09/06/2016
APPROVED BY : SR
APPROVED DATE :

REMARK

JACOBS

Hole ID **A1-GW3**

CLIENT : Bankstown Airport Limited
CONTRACTOR : Epoca Environmental
PROJECT : Geotechnical Investigation
LOCATION : Bankstown Airport
PROJECT No. : IA110700

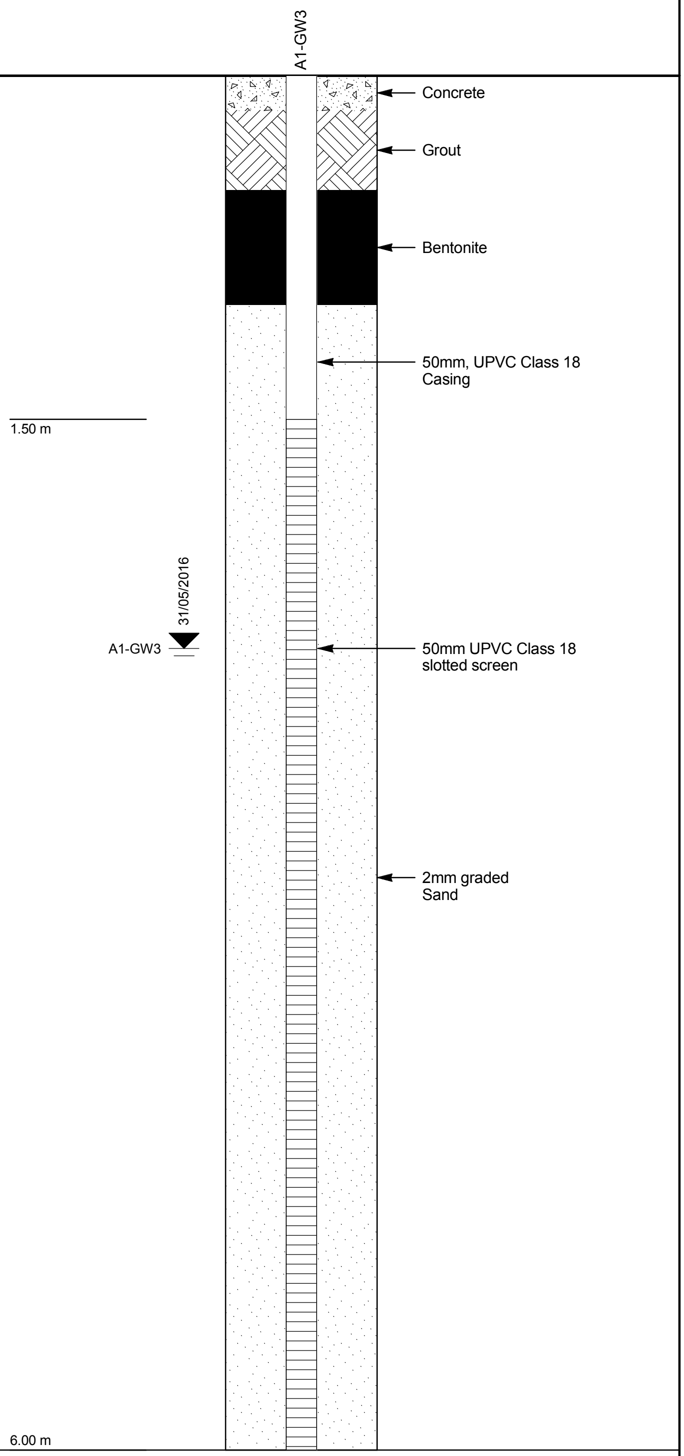
POSITION : Site 1
EASTING :
NORTHING :
COORD. SYS. : MGA94 Zone 56
GROUND RL :

SHEET : 1 OF 1
STATUS :
LOGGED BY : MG
DRILL DATE : 30/05/2016 - 31/05/2016

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T					Silty SAND: brown, fine grained sand, trace of fine to medium gravel, clay and rootlets, dry (topsoil)
					Silty CLAY: brown, grey, low plasticity, trace of fine grained sand and rootlets, dry to moist (fill)
					Silty SAND: pale grey, fine to medium grained sand, dry to moist (fill)
		1			Silty CLAY: grey, brown, medium plasticity, moist (alluvium) At 1.2m, as above but clay is high plasticity At 1.6m, as above but trace of organics
		2 3 4			Silty CLAY: red-brown, grey, high plasticity, moist (alluvium) At 3.0m, as above but with ironstone gravel, trace of sand At 4.0m, as above but with sand, trace of ironstone gravel
		5			Silty CLAY: grey, brown, high plasticity, trace of fine grained sand, moist (alluvium)
		6			End of borehole at 6.0m, target depth

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
A1-GW3	Standpipe Piezometer		6.00 m	31/05/2016	



RIG :
INCLINATION :
AZIMUTH :
HOLE DIA. :

CHECKED BY : JK
CHECKED DATE : 09/06/2016
APPROVED BY : SR
APPROVED DATE :

REMARK

Appendix C – Groundwater Field Data Sheets

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : A1-GW1

JACOBS

Project No : IA110700
Project Name : Bankstown Airport - Site 1

Gauging

Date :
Performed By :
Gauging Method :
Well Diameter :
Time :
Bore Depth :
LNAPL Present : Y / N
SWL :
Depth to LNAPL :
(If yes, thickness) :
Comments :
DNAPL Present : Y / N
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / N
Photo Number :

Purging / Development

Date : 16/05/16
Performed By : BC
Well Diameter : 50mm
Purge Method : Submersible pump
Time Started : 840
SWL (start) : 7.989
Volume Removed : 25L
Bore Depth (start) : 7.991
Time Stopped : 915
SWL (end) : Dry
Discharge Rate :
Bore Depth (end) :
Comments : Brown, very highly turbid, no odour/sheen
Brown, highly turbid, no odour, no sheen.
NAPL Present : Y / [✓ N]
(If yes, thickness) :

Sampling

Date : 20/06/16
Performed By : BC
Well Diameter : 50mm
Sampling Method : Perastaltic pump
Time Started : 935
Sampling Depth : ~ 7.5
Time Stopped : 1102
SWL (start) : 2.850
Tubing Type : LDPE
SWL (end) : 3.068
Comments : ~~Brown, very highly turbid~~

Duplicate Sample Collected? [✓ Y] / N
Duplicate Sample ID : A1 - QC07

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen		SWL (m)	Comments (colour, turbidity, odours, sheen etc)
						(ppm)	%Sat		
941	0.1	16294	6.77	18.6	194.9	4.24	48.3	2.882	light brown, low turbidity, no odour/ no sheen.
948	0.5	16392	6.63	19.0	188.2	4.00	46.0	2.948	
954	1.0	16338	6.61	19.0	183.4	3.57	41.1	2.987	
1000	1.5	16270	6.60	18.8	173.0	3.43	39.3	3.026	light brown, low turbidity, no odour, no sheen.
1006	2.0	16232	6.59	19.1	171.9	3.39	39.2	3.038	
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______ (X) ______ (=) 9.804 L

29.4L

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : A1-GW2 **JACOBS**

Project No : IA110700 **Project Name :** Bankstown Airport - Site 1

Gauging

Date :
Performed By :
Gauging Method :
Well Diameter :
Time :
Bore Depth :
LNAPL Present : Y / N
SWL :
Depth to LNAPL :
(If yes, thickness) :
Comments :
DNAPL Present : Y / N
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / N
Photo Number :

Purging / Development

Date : 16/06/16
Performed By : BC
Well Diameter : 50mm
Purge Method : Submersible pump
Time Started : 750
SWL (start) : 3.497
Volume Removed : 16L
Bore Depth (start) : 6.965
Time Stopped : 830
SWL (end) : Dry
Discharge Rate :
Bore Depth (end) :
Comments : ~~[illegible]~~ brown, highly turbid, no odour/sheen. Brown, mod-high turbidity, no odour, no sheen
NAPL Present : Y / [✓ N]
(If yes, thickness) :

Sampling

Date : 20/06/16
Performed By : BC
Well Diameter : 50mm
Sampling Method : Perastaltic pump
Time Started : 754
Sampling Depth : ~6.4
Time Stopped : 925
SWL (start) : 3.303
Tubing Type : LDPE
SWL (end) : 3.860
Comments :

Duplicate Sample Collected? Y / [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (ppm)	Dissolved Oxygen ~~(mg/L)~~ % Sat	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
759	0.1	22385	6.95	18.4	171.0	4.68	54.7	3.426	Clear/transparent, v. low turbidity,
806	0.5	22372	6.76	18.6	224.7	4.44	52.1	3.536	no odour/sheen.
813	1.0	22416	6.74	18.8	251.6	4.53	53.4	3.584	
820	1.5	22415	6.72	18.9	279.5	4.45	52.4	3.667	
827	2.0	21923	6.71	17.5	292.6	4.01	46.2	3.728	
834.	2.5	22136	6.71	18.4	343.7	4.41	51.6	3.832	
841	3.0	22182	6.71	18.3		4.30	50.8	3.845	Clear/transparent, v. low turbidity,
848	3.5	22364	6.70	18.0	376.8	4.28	50.5	3.852	no odour, no sheen
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

605
840

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
_____ m (-) _____ (=) 3.468

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
_____ (X) _____ (=) 6.8 L

20L

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : At-GW3 **JACOBS**

Project No : IA110700

Project Name : Bankstown Airport - Site 1

Gauging

Date :
Performed By :
Well Diameter :
Gauging Method :
LNAPL Present : Y / N
Time :
Bore Depth :
(If yes, thickness) :
SWL :
Depth to LNAPL :
DNAPL Present : Y / N
Comments :
(If yes, thickness) :
Visual confirmation with bailer : Y / N
Maintainance required :
Photo Number :

Purging / Development

Date : 16/05/16
Performed By : BC
Well Diameter : 50 mm
Purge Method : Submersible pump
Time Started : 920
SWL (start) : 2.557
Volume Removed : 21L
Bore Depth (start) : 5.991
Time Stopped : 945
SWL (end) : Dry.
Discharge Rate :
Bore Depth (end) : 5.992
NAPL Present : Y / [✓ N]
Comments : Brown, v. highly turbid, no odour/sheen.
Brown, highly turbid, no odour/sheen
(If yes, thickness) :

Sampling

Date : 20/06/16
Performed By : BC
Well Diameter : 50mm
Sampling Method : Perastaltic pump
Sampling Depth : ~5.5 m
Time Started : 1113
SWL (start) : 2.443
Time Stopped : 1225
SWL (end) : 2.650
Tubing Type : LDPE
Comments :

Duplicate Sample Collected? Y / [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (ppm)	Dissolved Oxygen ~~(mg/L)~~ % Sat	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
1117	0.1	23929	5.68	18.8	17.0	2.56	30.4	2.475	light brown, low turbidity, no odour/sheen.
1123	0.5	24408	5.23	19.1	160.3	2.49	29.4	2.535	
1129	1.0	24252	5.20	18.9	182.0	2.68	31.3	2.573	
1135	1.5	24268	5.17	18.9	188.0	2.40	29.0	2.604	
1141	2.0	24181	5.17	18.9	188.8	2.70	32.2	2.617	
1147.	2.5	24118	5.15	18.8	189.3	2.57	30.6	2.624	
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
_____ m (-) _____ (=) _____

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
_____ (X) _____ (=) 6.73 L

20.2 L

Appendix D – Calibration Certificate

17/6/16

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 12D100012

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		NH1818	pH 7.02
2. pH 4.00		pH 4.00		NF1636	pH 4.09
3. pH 10.00		pH 10.00		NH1870	pH 10.09
4. mV		228.5mV		NH1934/NH1935	228.6mV
5. EC		2.76mS		NF2056	2.76mS
6. D.O		0.00ppm		4005	0.00ppm
7. Temp		22.7°C		MultiTherm	22.5°C

Calibrated by: Lin Wang

Calibration date: 17/06/2016

Next calibration due: 17/07/2016

Appendix E – Laboratory Certificates

Certificate of Analysis

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Michael Stacey**

Report **502324-S**
Project name BANKSTOWN AIRPORT - SITE 1
Project ID IA110700
Received Date May 27, 2016

Client Sample ID			**A1_BH1_0.0**	**A1_BH4_0.5**	**A1_TP01_0.0**	**A1_TP01_1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28376**	**S16-My28377**	**S16-My28378**	**S16-My28379**
Date Sampled			**May 24, 2016**	**May 24, 2016**	**May 25, 2016**	**May 25, 2016**
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	%	97	95	94	92
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID			**A1_BH1_0.0**	**A1_BH4_0.5**	**A1_TP01_0.0**	**A1_TP01_1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28376**	**S16-My28377**	**S16-My28378**	**S16-My28379**
Date Sampled			**May 24, 2016**	**May 24, 2016**	**May 25, 2016**	**May 25, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 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	88	91	88
p-Terphenyl-d14 (surr.)	1	%	96	91	95	91
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	-	65	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	107	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	65	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	^{N09}0.22	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	^{N09}0.006	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	< 0.01	-
13C-PFHxA (surr.)	1	%	-	-	92	-
13C8-PFOS (surr.)	1	%	-	-	84	-

Client Sample ID			**A1_BH1_0.0**	**A1_BH4_0.5**	**A1_TP01_0.0**	**A1_TP01_1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28376**	**S16-My28377**	**S16-My28378**	**S16-My28379**
Date Sampled			**May 24, 2016**	**May 24, 2016**	**May 25, 2016**	**May 25, 2016**
Test/Reference	LOR	Unit				
% Moisture	1	%	6.1	20	6.1	23
Heavy Metals						
Arsenic	2	mg/kg	4.3	5.0	4.1	8.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.9	12	7.6	23
Copper	5	mg/kg	< 5	8.3	< 5	12
Lead	5	mg/kg	13	7.5	100	17
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	< 5	5.5	14	16

Client Sample ID			**A1_TP03_0.0**	**A1_TP03_0.5**	**A1_BH2_0.0**	**A1_BH5_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28380**	**S16-My28381**	**S16-My28382**	**S16-My28383**
Date Sampled			**May 25, 2016**	**May 25, 2016**	**May 25, 2016**	**May 25, 2016**
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	36	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	190	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	240	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	466	< 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	%	92	94	96	93
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP03_0.0** **Soil** **S16-My28380** **May 25, 2016**	**A1_TP03_0.5** **Soil** **S16-My28381** **May 25, 2016**	**A1_BH2_0.0** **Soil** **S16-My28382** **May 25, 2016**	**A1_BH5_0.5** **Soil** **S16-My28383** **May 25, 2016**
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	89	88	122
p-Terphenyl-d14 (surr.)	1	%	91	90	90	129
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	82	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	124	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	82	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	400	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			**A1_TP03_0.0**	**A1_TP03_0.5**	**A1_BH2_0.0**	**A1_BH5_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28380**	**S16-My28381**	**S16-My28382**	**S16-My28383**
Date Sampled			**May 25, 2016**	**May 25, 2016**	**May 25, 2016**	**May 25, 2016**
Test/Reference	LOR	Unit				
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	^{N09}3.8	-	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	^{N09}0.046	-	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	^{N09}0.04	-	-	-
13C-PFHxA (surr.)	1	%	98	-	-	-
13C8-PFOS (surr.)	1	%	115	-	-	-
% Moisture	1	%	12	23	7.2	19
Heavy Metals						
Arsenic	2	mg/kg	2.6	7.4	11	16
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.5	24	15	35
Copper	5	mg/kg	5.4	7.3	< 5	10
Lead	5	mg/kg	1000	12	140	24
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	29	< 5	6.0	9.5

Client Sample ID			**A1_BH7_1.5**	**A1_BH8_0.0**	**A1_TP04_0.0**	**A1_TP05_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28384**	**S16-My28385**	**S16-My28386**	**S16-My28387**
Date Sampled			**May 25, 2016**	**May 25, 2016**	**May 26, 2016**	**May 26, 2016**
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	55	< 50
TRH C29-C36	50	mg/kg	< 50	69	96	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	69	151	< 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	%	96	93	96	94
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID			**A1_BH7_1.5**	**A1_BH8_0.0**	**A1_TP04_0.0**	**A1_TP05_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28384**	**S16-My28385**	**S16-My28386**	**S16-My28387**
Date Sampled			**May 25, 2016**	**May 25, 2016**	**May 26, 2016**	**May 26, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	88	89	89
p-Terphenyl-d14 (surr.)	1	%	97	95	91	92
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1
Dibutylchlorendate (surr.)	1	%	-	-	-	74
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	116
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	74

Client Sample ID			**A1_BH7_1.5**	**A1_BH8_0.0**	**A1_TP04_0.0**	**A1_TP05_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28384**	**S16-My28385**	**S16-My28386**	**S16-My28387**
Date Sampled			**May 25, 2016**	**May 25, 2016**	**May 26, 2016**	**May 26, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	130	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	-	[N09]0.012
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	-	< 0.01
13C-PFHxA (surr.)	1	%	-	-	-	61
13C8-PFOS (surr.)	1	%	-	-	-	101
% Moisture	1	%	15	11	7.7	13
Heavy Metals						
Arsenic	2	mg/kg	5.2	7.4	16	10
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	15	8.4	30
Copper	5	mg/kg	13	18	10	9.8
Lead	5	mg/kg	10	21	7400	58
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.05
Nickel	5	mg/kg	< 5	13	< 5	9.0
Zinc	5	mg/kg	7.4	24	24	47

Client Sample ID			**A1_TP05_0.7**	**A1_TP09_0.5**	**A1_TP10_0.0**	**A1_TP10_2.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28391**	**S16-My28395**	**S16-My28396**	**S16-My28397**
Date Sampled			**May 26, 2016**	**May 26, 2016**	**May 26, 2016**	**May 26, 2016**
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	150	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	220	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	370	< 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	%	97	95	86	93
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			**A1_TP05_0.7**	**A1_TP09_0.5**	**A1_TP10_0.0**	**A1_TP10_2.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28391**	**S16-My28395**	**S16-My28396**	**S16-My28397**
Date Sampled			**May 26, 2016**	**May 26, 2016**	**May 26, 2016**	**May 26, 2016**
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	%	86	81	90	90
p-Terphenyl-d14 (surr.)	1	%	88	82	95	93
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	-	65	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	104	-

Client Sample ID			**A1_TP05_0.7**	**A1_TP09_0.5**	**A1_TP10_0.0**	**A1_TP10_2.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28391**	**S16-My28395**	**S16-My28396**	**S16-My28397**
Date Sampled			**May 26, 2016**	**May 26, 2016**	**May 26, 2016**	**May 26, 2016**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	65	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	360	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	[N09]0.018	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	< 0.01	-
13C-PFHxA (surr.)	1	%	-	-	85	-
13C8-PFOS (surr.)	1	%	-	-	85	-
% Moisture	1	%	8.6	22	14	23
Heavy Metals						
Arsenic	2	mg/kg	11	15	8.9	7.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	38	17	20
Copper	5	mg/kg	8.2	12	16	10
Lead	5	mg/kg	120	38	54	15
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	6.9	8.2	< 5
Zinc	5	mg/kg	33	21	30	< 5

Client Sample ID			**A1_TP12_0.0**	**A1_TP12_0.5**	**A1_TP14_0.0**	**A1_TP14_1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28398**	**S16-My28400**	**S16-My28401**	**S16-My28403**
Date Sampled			**May 26, 2016**	**May 26, 2016**	**May 26, 2016**	**May 26, 2016**
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	200	75	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	200	75	< 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

Client Sample ID			**A1_TP12_0.0**	**A1_TP12_0.5**	**A1_TP14_0.0**	**A1_TP14_1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28398**	**S16-My28400**	**S16-My28401**	**S16-My28403**
Date Sampled			**May 26, 2016**	**May 26, 2016**	**May 26, 2016**	**May 26, 2016**
Test/Reference	LOR	Unit				
BTEX						
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	94	94	94	93
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	88	86	73	85
p-Terphenyl-d14 (surr.)	1	%	94	89	71	86
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID			A1_TP12_0.0	A1_TP12_0.5	A1_TP14_0.0	A1_TP14_1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-My28398	S16-My28400	S16-My28401	S16-My28403
Date Sampled			May 26, 2016	May 26, 2016	May 26, 2016	May 26, 2016
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	63	-	66	-
Tetrachloro-m-xylene (surr.)	1	%	91	-	93	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	63	-	66	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	190	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	^{N09}0.012	-	< 0.005	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	< 0.01	-
13C-PFHxA (surr.)	1	%	80	-	100	-
13C8-PFOS (surr.)	1	%	75	-	92	-
% Moisture	1	%	5.8	10	15	20
Heavy Metals						
Arsenic	2	mg/kg	3.7	15	8.7	6.3
Cadmium	0.4	mg/kg	0.9	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	17	18	19
Copper	5	mg/kg	28	52	15	8.5
Lead	5	mg/kg	32	33	21	10
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	40	26	5.0	< 5
Zinc	5	mg/kg	55	100	19	< 5

Client Sample ID			A1_TP15_0.5	A1_TP02_0.0	A1_TP02_2.5	A1_TP06_0.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-My28405	S16-My28406	S16-My28408	S16-My28409
Date Sampled			May 26, 2016	May 27, 2016	May 27, 2016	May 27, 2016
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	74
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	150
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	224

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP15_0.5** **Soil** **S16-My28405** **May 26, 2016**	**A1_TP02_0.0** **Soil** **S16-My28406** **May 27, 2016**	**A1_TP02_2.5** **Soil** **S16-My28408** **May 27, 2016**	**A1_TP06_0.0** **Soil** **S16-My28409** **May 27, 2016**
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	%	94	94	96	92
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	89	88	88	88
p-Terphenyl-d14 (surr.)	1	%	93	90	92	89
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP15_0.5** **Soil** **S16-My28405** **May 26, 2016**	**A1_TP02_0.0** **Soil** **S16-My28406** **May 27, 2016**	**A1_TP02_2.5** **Soil** **S16-My28408** **May 27, 2016**	**A1_TP06_0.0** **Soil** **S16-My28409** **May 27, 2016**
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	-	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	-	67	-	70
Tetrachloro-m-xylene (surr.)	1	%	-	120	-	125
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	67	-	70
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	210
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	[N09]2.0	-	[N09]3.4
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	[N09]0.024	-	[N09]0.006
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	< 0.01	-	< 0.01
13C-PFHxA (surr.)	1	%	-	94	-	92
13C8-PFOS (surr.)	1	%	-	80	-	69
% Clay	1	%	-	-	48	-
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	-	-	870	-
pH (units)(1:5 soil:CaCl2 extract)	0.1	pH Units	-	-	5.3	-
% Moisture	1	%	7.9	4.2	16	5.9
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	-	12	-
Heavy Metals						
Arsenic	2	mg/kg	9.1	2.8	5.9	5.9
Cadmium	0.4	mg/kg	< 0.4	0.6	< 0.4	0.5
Chromium	5	mg/kg	17	7.3	10	14
Copper	5	mg/kg	9.3	5.6	8.7	9.5
Lead	5	mg/kg	65	17	10	330
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	7.6
Zinc	5	mg/kg	30	9.2	< 5	32

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP06_0.3** **Soil** **S16-My28410** **May 27, 2016**	**A1_TP07_0.0** **Soil** **S16-My28411** **May 27, 2016**	**A1_TP07_0.5** **Soil** **S16-My28412** **May 27, 2016**	**A1_TP08_0.5** **Soil** **S16-My28415** **May 27, 2016**
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	80	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	80	< 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	%	93	94	93	93
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	88	91	89	89
p-Terphenyl-d14 (surr.)	1	%	91	92	90	95
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-

Client Sample ID			**A1_TP06_0.3**	**A1_TP07_0.0**	**A1_TP07_0.5**	**A1_TP08_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28410**	**S16-My28411**	**S16-My28412**	**S16-My28415**
Date Sampled			**May 27, 2016**	**May 27, 2016**	**May 27, 2016**	**May 27, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Dibutylchlorendate (surr.)	1	%	-	62	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	114	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	62	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	[N09]5.7	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	[N09]0.006	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	< 0.01	-	-
13C-PFHxA (surr.)	1	%	-	84	-	-
13C8-PFOS (surr.)	1	%	-	92	-	-
% Moisture	1	%	15	8.1	18	16
Heavy Metals						
Arsenic	2	mg/kg	5.5	8.3	5.6	15
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.1	19	19	33
Copper	5	mg/kg	< 5	20	9.6	16
Lead	5	mg/kg	10	280	11	270
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	9.5	< 5	6.9
Zinc	5	mg/kg	< 5	52	< 5	33

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP11_0.0** **Soil** **S16-My28416** **May 27, 2016**	**A1_TP11_0.5** **Soil** **S16-My28419** **May 27, 2016**	**A1_TP17_0.0** **Soil** **S16-My28420** **May 27, 2016**	**A1_TP17_1.0** **Soil** **S16-My28421** **May 27, 2016**
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	170	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	170	< 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	%	90	94	92	92
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	88	89	90	87
p-Terphenyl-d14 (surr.)	1	%	93	93	93	88
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP11_0.0** **Soil** **S16-My28416** **May 27, 2016**	**A1_TP11_0.5** **Soil** **S16-My28419** **May 27, 2016**	**A1_TP17_0.0** **Soil** **S16-My28420** **May 27, 2016**	**A1_TP17_1.0** **Soil** **S16-My28421** **May 27, 2016**
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	59	-	77	-
Tetrachloro-m-xylene (surr.)	1	%	101	-	116	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	59	-	77	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	140	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	110	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	^{N09}0.23	-	^{N09}0.011	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	< 0.01	-
13C-PFHxA (surr.)	1	%	87	-	96	-
13C8-PFOS (surr.)	1	%	100	-	87	-
% Moisture	1	%	8.4	8.2	24	14
Heavy Metals						
Arsenic	2	mg/kg	9.9	9.1	4.1	2.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	1.2	< 0.4
Chromium	5	mg/kg	17	16	13	6.0
Copper	5	mg/kg	21	29	10	< 5
Lead	5	mg/kg	110	120	52	6.7
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	9.5	16	5.5	< 5
Zinc	5	mg/kg	38	55	26	< 5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP18_0.0** **Soil** **S16-My28422** **May 27, 2016**	**A1_TP18_0.5** **Soil** **S16-My28423** **May 27, 2016**	**TS160517_4** **Soil** **S16-My28424** **May 27, 2016**	**TB160517_4** **Soil** **S16-My28426** **May 27, 2016**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	< 50	< 50	-	-
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	100%	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	99%	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	98%	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	98%	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	98%	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	98%	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	93	93	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	86	87	-	-
p-Terphenyl-d14 (surr.)	1	%	91	91	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-

Client Sample ID			A1_TP18_0.0	A1_TP18_0.5	TS160517_4	TB160517_4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My28422**	**S16-My28423**	**S16-My28424**	**S16-My28426**
Date Sampled			**May 27, 2016**	**May 27, 2016**	**May 27, 2016**	**May 27, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	73	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	114	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	73	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	^{N09}0.006	-	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	-	-
13C-PFHxA (surr.)	1	%	84	-	-	-
13C8-PFOS (surr.)	1	%	93	-	-	-
% Moisture	1	%	22	15	-	-
Heavy Metals						
Arsenic	2	mg/kg	7.5	8.3	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	13	22	-	-
Copper	5	mg/kg	9.9	15	-	-
Lead	5	mg/kg	20	16	-	-
Mercury	0.05	mg/kg	< 0.05	< 0.05	-	-
Nickel	5	mg/kg	5.3	7.7	-	-
Zinc	5	mg/kg	14	13	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_BH3_0.0** **Soil** **S16-My28427** **May 26, 2016**	**A1_BH6_0.5** **Soil** **S16-My28428** **May 26, 2016**	**A1_BH9_1.5** **Soil** **S16-My28429** **May 26, 2016**	**A1_BH10_0.0** **Soil** **S16-My28430** **May 26, 2016**
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	%	95	91	93	92
% Moisture	1	%	9.0	6.8	19	6.6

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	Sydney	Jun 02, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jun 01, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 01, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 02, 2016	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	Jun 01, 2016	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Sydney	Jun 02, 2016	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Jun 02, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
PFOS/PFOA/6:2FTS	Brisbane	Jun 01, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
% Clay	Brisbane	May 31, 2016	6 Day
- Method: LTM-GEN-7040			
pH (units)(1:5 soil:CaCl2 extract)	Sydney	Jun 01, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C)	Sydney	Jun 06, 2016	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	Jun 03, 2016	
% Moisture	Sydney	May 28, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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Report #: 502324
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 27, 2016 7:50 PM
Due: Jun 6, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	A1_BH1_0.0	May 24, 2016		Soil	S16-My28376										X		X
2	A1_BH4_0.5	May 24, 2016		Soil	S16-My28377										X		X
3	A1_TP01_0.0	May 25, 2016		Soil	S16-My28378		X						X	X	X		X
4	A1_TP01_1.0	May 25, 2016		Soil	S16-My28379										X		X
5	A1_TP03_0.0	May 25, 2016		Soil	S16-My28380								X	X	X		X
6	A1_TP03_0.5	May 25, 2016		Soil	S16-My28381										X		X
7	A1_BH2_0.0	May 25, 2016		Soil	S16-My28382										X		X
8	A1_BH5_0.5	May 25, 2016		Soil	S16-My28383										X		X
9	A1_BH7_1.5	May 25, 2016		Soil	S16-My28384										X		X
10	A1_BH8_0.0	May 25, 2016		Soil	S16-My28385										X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
11	A1_TP04_0.0	May 26, 2016		Soil	S16-My28386		X								X		X
12	A1_TP05_0.0	May 26, 2016		Soil	S16-My28387								X	X	X		X
13	A1_TP05_0.3	May 26, 2016		Soil	S16-My28388		X										
14	A1_TP05_ASB_0.3	May 26, 2016		Soil	S16-My28389			X									
15	A1_TP05_ASB_0.4	May 26, 2016		Soil	S16-My28390			X									
16	A1_TP05_0.7	May 26, 2016		Soil	S16-My28391										X		X
17	A1_TP09_0.2	May 26, 2016		Soil	S16-My28392		X										
18	A1_TP09_ASB_0.2	May 26, 2016		Soil	S16-My28393			X									
19	A1_TP09_ASB_0.4	May 26, 2016		Soil	S16-My28394			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
20	A1_TP09_0.5	May 26, 2016		Soil	S16-My28395										X		X
21	A1_TP10_0.0	May 26, 2016		Soil	S16-My28396								X	X	X		X
22	A1_TP10_2.0	May 26, 2016		Soil	S16-My28397										X		X
23	A1_TP12_0.0	May 26, 2016		Soil	S16-My28398		X						X	X	X		X
24	A1_TP12_ASB_0.4	May 26, 2016		Soil	S16-My28399			X									
25	A1_TP12_0.5	May 26, 2016		Soil	S16-My28400										X		X
26	A1_TP14_0.0	May 26, 2016		Soil	S16-My28401		X						X	X	X		X
27	A1_TP14_ASB_0.2	May 26, 2016		Soil	S16-My28402			X									
28	A1_TP14_1.0	May 26, 2016		Soil	S16-My28403										X		X
29	A1_TP15_ASB	May 26, 2016		Soil	S16-My28404			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
	_0.2																
30	A1_TP15_0.5	May 26, 2016		Soil	S16-My28405										X		X
31	A1_TP02_0.0	May 27, 2016		Soil	S16-My28406								X	X	X		X
32	A1_TP02_0.2	May 27, 2016		Soil	S16-My28407		X										
33	A1_TP02_2.5	May 27, 2016		Soil	S16-My28408	X					X				X	X	X
34	A1_TP06_0.0	May 27, 2016		Soil	S16-My28409		X						X	X	X		X
35	A1_TP06_0.3	May 27, 2016		Soil	S16-My28410										X		X
36	A1_TP07_0.0	May 27, 2016		Soil	S16-My28411		X						X	X	X		X
37	A1_TP07_0.5	May 27, 2016		Soil	S16-My28412										X		X
38	A1_TP08_0.3	May 27, 2016		Soil	S16-My28413		X										
39	A1_TP08_ASB_0.4	May 27, 2016		Soil	S16-My28414			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
40	A1_TP08_0.5	May 27, 2016		Soil	S16-My28415										X		X
41	A1_TP11_0.0	May 27, 2016		Soil	S16-My28416		X						X	X	X		X
42	A1_TP11_0.3	May 27, 2016		Soil	S16-My28417		X										
43	A1_TP11_ASB_0.4	May 27, 2016		Soil	S16-My28418				X								
44	A1_TP11_0.5	May 27, 2016		Soil	S16-My28419										X		X
45	A1_TP17_0.0	May 27, 2016		Soil	S16-My28420								X	X	X		X
46	A1_TP17_1.0	May 27, 2016		Soil	S16-My28421										X		X
47	A1_TP18_0.0	May 27, 2016		Soil	S16-My28422		X						X	X	X		X
48	A1_TP18_0.5	May 27, 2016		Soil	S16-My28423										X		X
49	TS160517_4	May 27, 2016		Soil	S16-My28424							X					
50	TB160517_4	May 27, 2016		Soil	S16-My28426							X					

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
51	A1_BH3_0.0	May 26, 2016		Soil	S16-My28427							X			X		
52	A1_BH6_0.5	May 26, 2016		Soil	S16-My28428							X			X		
53	A1_BH9_1.5	May 26, 2016		Soil	S16-My28429							X			X		
54	A1_BH10_0.0	May 26, 2016		Soil	S16-My28430							X			X		
55	A1_BH1_0.5	May 24, 2016		Soil	S16-My28431					X							
56	A1_BH1_1.5	May 24, 2016		Soil	S16-My28432					X							
57	A1_BH4_0.0	May 24, 2016		Soil	S16-My28433					X							
58	A1_BH4_1.5	May 24, 2016		Soil	S16-My28434					X							
59	A1_TP01_0.5	May 25, 2016		Soil	S16-My28435					X							
60	A1_TP03_1.0	May 25, 2016		Soil	S16-My28436					X							
61	A1_BH2_0.5	May 25, 2016		Soil	S16-My28437					X							

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
62	A1_BH2_1.5	May 25, 2016		Soil	S16-My28438					X							
63	A1_BH5_0.0	May 25, 2016		Soil	S16-My28439					X							
64	A1_BH5_1.5	May 25, 2016		Soil	S16-My28440					X							
65	A1_BH7_0.0	May 25, 2016		Soil	S16-My28441					X							
66	A1_BH7_0.5	May 25, 2016		Soil	S16-My28442					X							
67	A1_BH8_0.5	May 25, 2016		Soil	S16-My28443					X							
68	A1_BH8_1.5	May 25, 2016		Soil	S16-My28444					X							
69	A1_TP04_0.4	May 26, 2016		Soil	S16-My28445					X							
70	A1_TP04_0.6	May 26, 2016		Soil	S16-My28446					X							
71	A1_TP04_1.0	May 26, 2016		Soil	S16-My28447					X							
72	A1_TP04_2.0	May 26, 2016		Soil	S16-My28448					X							

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
73	A1_TP04_2.5	May 26, 2016		Soil	S16-My28449					X							
74	A1_TP05_1.0	May 26, 2016		Soil	S16-My28450					X							
75	A1_TP05_2.0	May 26, 2016		Soil	S16-My28451					X							
76	A1_TP05_2.5	May 26, 2016		Soil	S16-My28452					X							
77	A1_TP09_0.0	May 26, 2016		Soil	S16-My28453					X							
78	A1_TP09_0.7	May 26, 2016		Soil	S16-My28454					X							
79	A1_TP09_1.0	May 26, 2016		Soil	S16-My28455					X							
80	A1_TP10_0.5	May 26, 2016		Soil	S16-My28456					X							
81	A1_TP10_0.9	May 26, 2016		Soil	S16-My28457					X							
82	A1_TP10_1.1	May 26, 2016		Soil	S16-My28458					X							
83	A1_TP10_2.5	May 26, 2016		Soil	S16-My28459					X							

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
84	A1_TP12_0.8	May 26, 2016		Soil	S16-My28460					X							
85	A1_TP12_1.0	May 26, 2016		Soil	S16-My28461					X							
86	A1_TP12_2.0	May 26, 2016		Soil	S16-My28462					X							
87	A1_TP12_2.5	May 26, 2016		Soil	S16-My28463					X							
88	A1_TP14_0.5	May 26, 2016		Soil	S16-My28464					X							
89	A1_TP14_2.0	May 26, 2016		Soil	S16-My28465					X							
90	A1_TP14_2.5	May 26, 2016		Soil	S16-My28466					X							
91	A1_TP15_0.0	May 26, 2016		Soil	S16-My28467					X							
92	A1_TP15_0.8	May 26, 2016		Soil	S16-My28468					X							
93	A1_TP15_1.0	May 26, 2016		Soil	S16-My28469					X							
94	A1_TP02_0.5	May 27, 2016		Soil	S16-My28470					X							

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
95	A1_TP02_1.0	May 27, 2016		Soil	S16-My28471					X							
96	A1_TP02_2.0	May 27, 2016		Soil	S16-My28472					X							
97	A1_TP06_0.5	May 27, 2016		Soil	S16-My28473					X							
98	A1_TP06_1.0	May 27, 2016		Soil	S16-My28474					X							
99	A1_TP07_0.3	May 27, 2016		Soil	S16-My28475					X							
100	A1_TP07_1.0	May 27, 2016		Soil	S16-My28476					X							
101	A1_TP07_2.0	May 27, 2016		Soil	S16-My28477					X							
102	A1_TP07_2.5	May 27, 2016		Soil	S16-My28478					X							
103	A1_TP08_0.0	May 27, 2016		Soil	S16-My28479					X							
104	A1_TP08_0.8	May 27, 2016		Soil	S16-My28480					X							
105	A1_TP08_1.0	May 27, 2016		Soil	S16-My28481					X							

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
106	A1_TP08_2.0	May 27, 2016		Soil	S16-My28482					X							
107	A1_TP08_2.5	May 27, 2016		Soil	S16-My28483					X							
108	A1_TP11_ASB_0.3	May 27, 2016		Soil	S16-My28484				X								
109	A1_TP11_0.7	May 27, 2016		Soil	S16-My28485					X							
110	A1_TP11_1.0	May 27, 2016		Soil	S16-My28486					X							
111	A1_TP11_2.0	May 27, 2016		Soil	S16-My28487					X							
112	A1_TP11_2.5	May 27, 2016		Soil	S16-My28488					X							
113	A1_TP17_0.5	May 27, 2016		Soil	S16-My28489					X							
114	A1_TP18_0.8	May 27, 2016		Soil	S16-My28490					X							
115	A1_TP18_1.0	May 27, 2016		Soil	S16-My28491					X							
116	A1_BH3_0.5	May 26, 2016		Soil	S16-My28492					X							

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 27, 2016 7:50 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502324	**Due:**	Jun 6, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 1				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
117	A1_BH3_1.5	May 26, 2016		Soil	S16-My28493					X							
118	A1_BH6_0.0	May 26, 2016		Soil	S16-My28494					X							
119	A1_BH6_1.5	May 26, 2016		Soil	S16-My28495					X							
120	A1_BH9_0.0	May 26, 2016		Soil	S16-My28496					X							
121	A1_BH9_0.5	May 26, 2016		Soil	S16-My28497					X							
122	A1_BH10_0.5	May 26, 2016		Soil	S16-My28498					X							
123	A1_BH10_1.5	May 26, 2016		Soil	S16-My28499					X							
Test Counts						1	13	8	2	68	1	6	12	12	38	1	34

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram	**mg/l:** milligrams per litre
ug/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres	

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%

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	
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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	Pass	
Method Blank							
% Clay	%	< 1			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	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	73			70-130	Pass	
TRH C10-C14	%	103			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	92			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	93			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
o-Xylene	%	94			70-130	Pass	
Xylenes - Total	%	94			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	89			70-130	Pass	
TRH C6-C10	%	82			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	94			70-130	Pass	
Acenaphthylene	%	81			70-130	Pass	
Anthracene	%	99			70-130	Pass	
Benz(a)anthracene	%	86			70-130	Pass	
Benzo(a)pyrene	%	82			70-130	Pass	
Benzo(b&j)fluoranthene	%	83			70-130	Pass	
Benzo(g.h.i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	102			70-130	Pass	
Chrysene	%	111			70-130	Pass	
Dibenz(a.h)anthracene	%	80			70-130	Pass	
Fluoranthene	%	92			70-130	Pass	
Fluorene	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	78			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	108			70-130	Pass	
Pyrene	%	102			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	108			70-130	Pass	
4.4'-DDD	%	109			70-130	Pass	
4.4'-DDE	%	111			70-130	Pass	
4.4'-DDT	%	110			70-130	Pass	
a-BHC	%	106			70-130	Pass	
Aldrin	%	105			70-130	Pass	
b-BHC	%	97			70-130	Pass	
d-BHC	%	112			70-130	Pass	
Dieldrin	%	105			70-130	Pass	
Endosulfan I	%	106			70-130	Pass	
Endosulfan II	%	106			70-130	Pass	
Endosulfan sulphate	%	109			70-130	Pass	
Endrin	%	104			70-130	Pass	
Endrin aldehyde	%	110			70-130	Pass	
Endrin ketone	%	103			70-130	Pass	
g-BHC (Lindane)	%	104			70-130	Pass	
Heptachlor	%	102			70-130	Pass	
Heptachlor epoxide	%	107			70-130	Pass	
Hexachlorobenzene	%	96			70-130	Pass	
Methoxychlor	%	100			70-130	Pass	
Toxaphene	%	88			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	122			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	101			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	105			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	96			50-150	Pass	
LCS - % Recovery							
% Clay	%	110			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Heavy Metals							
Arsenic	%	104			70-130	Pass	
Cadmium	%	109			70-130	Pass	
Chromium	%	93			70-130	Pass	
Copper	%	92			70-130	Pass	
Lead	%	91			70-130	Pass	
Mercury	%	104			70-130	Pass	
Nickel	%	107			70-130	Pass	
Zinc	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-My28376	CP	%	95			70-130	Pass	
Acenaphthylene	S16-My28376	CP	%	90			70-130	Pass	
Anthracene	S16-My28376	CP	%	97			70-130	Pass	
Benz(a)anthracene	S16-My28376	CP	%	93			70-130	Pass	
Benzo(a)pyrene	S16-My28376	CP	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	S16-My28376	CP	%	84			70-130	Pass	
Benzo(g.h.i)perylene	S16-My28376	CP	%	85			70-130	Pass	
Benzo(k)fluoranthene	S16-My28376	CP	%	100			70-130	Pass	
Chrysene	S16-My28376	CP	%	109			70-130	Pass	
Dibenz(a.h)anthracene	S16-My28376	CP	%	83			70-130	Pass	
Fluoranthene	S16-My28376	CP	%	93			70-130	Pass	
Fluorene	S16-My28376	CP	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-My28376	CP	%	83			70-130	Pass	
Naphthalene	S16-My28376	CP	%	101			70-130	Pass	
Phenanthrene	S16-My28376	CP	%	107			70-130	Pass	
Pyrene	S16-My28376	CP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My28377	CP	%	77			70-130	Pass	
TRH C10-C14	S16-My28377	CP	%	106			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My28377	CP	%	88			70-130	Pass	
Toluene	S16-My28377	CP	%	90			70-130	Pass	
Ethylbenzene	S16-My28377	CP	%	89			70-130	Pass	
m&p-Xylenes	S16-My28377	CP	%	90			70-130	Pass	
o-Xylene	S16-My28377	CP	%	90			70-130	Pass	
Xylenes - Total	S16-My28377	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My28377	CP	%	89			70-130	Pass	
TRH C6-C10	S16-My28377	CP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My28377	CP	%	105			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-Jn02686	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S16-My27938	NCP	%	95			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanesulfonic acid (PFOS)	B16-Jn00475	NCP	%	111			50-150	Pass	
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanoic acid (PFOA)	S16-My28380	CP	%	128			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My28380	CP	%	128			50-150	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My28385	CP	%	87			70-130	Pass	
Cadmium	S16-My28385	CP	%	94			70-130	Pass	
Chromium	S16-My28385	CP	%	90			70-130	Pass	
Copper	S16-My28385	CP	%	82			70-130	Pass	
Lead	S16-My28385	CP	%	75			70-130	Pass	
Mercury	S16-My28385	CP	%	100			70-130	Pass	
Nickel	S16-My28385	CP	%	97			70-130	Pass	
Zinc	S16-My28385	CP	%	108			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-My28386	CP	%	94			70-130	Pass	
Acenaphthylene	S16-My28386	CP	%	94			70-130	Pass	
Anthracene	S16-My28386	CP	%	94			70-130	Pass	
Benz(a)anthracene	S16-My28386	CP	%	98			70-130	Pass	
Benzo(a)pyrene	S16-My28386	CP	%	94			70-130	Pass	
Benzo(b&j)fluoranthene	S16-My28386	CP	%	92			70-130	Pass	
Benzo(g.h.i)perylene	S16-My28386	CP	%	86			70-130	Pass	
Benzo(k)fluoranthene	S16-My28386	CP	%	100			70-130	Pass	
Chrysene	S16-My28386	CP	%	109			70-130	Pass	
Dibenz(a.h)anthracene	S16-My28386	CP	%	83			70-130	Pass	
Fluoranthene	S16-My28386	CP	%	102			70-130	Pass	
Fluorene	S16-My28386	CP	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-My28386	CP	%	85			70-130	Pass	
Naphthalene	S16-My28386	CP	%	100			70-130	Pass	
Phenanthrene	S16-My28386	CP	%	109			70-130	Pass	
Pyrene	S16-My28386	CP	%	111			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My28387	CP	%	73			70-130	Pass	
TRH C10-C14	S16-My28387	CP	%	110			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My28387	CP	%	86			70-130	Pass	
Toluene	S16-My28387	CP	%	90			70-130	Pass	
Ethylbenzene	S16-My28387	CP	%	89			70-130	Pass	
m&p-Xylenes	S16-My28387	CP	%	90			70-130	Pass	
o-Xylene	S16-My28387	CP	%	90			70-130	Pass	
Xylenes - Total	S16-My28387	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My28387	CP	%	86			70-130	Pass	
TRH C6-C10	S16-My28387	CP	%	81			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My28387	CP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My28403	CP	%	92			70-130	Pass	
Cadmium	S16-My28403	CP	%	105			70-130	Pass	
Chromium	S16-My28403	CP	%	94			70-130	Pass	
Copper	S16-My28403	CP	%	87			70-130	Pass	
Lead	S16-My28403	CP	%	103			70-130	Pass	
Mercury	S16-My28403	CP	%	107			70-130	Pass	
Nickel	S16-My28403	CP	%	99			70-130	Pass	
Zinc	S16-My28403	CP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My28406	CP	%	78			70-130	Pass	
TRH C10-C14	S16-My28406	CP	%	112			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My28406	CP	%	90			70-130	Pass	
Toluene	S16-My28406	CP	%	90			70-130	Pass	
Ethylbenzene	S16-My28406	CP	%	90			70-130	Pass	
m&p-Xylenes	S16-My28406	CP	%	90			70-130	Pass	
o-Xylene	S16-My28406	CP	%	90			70-130	Pass	
Xylenes - Total	S16-My28406	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My28406	CP	%	83			70-130	Pass	
TRH C6-C10	S16-My28406	CP	%	84			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S16-My28406	CP	%	130			70-130	Pass	
4.4'-DDE	S16-My28406	CP	%	109			70-130	Pass	
4.4'-DDT	S16-My28406	CP	%	78			70-130	Pass	
a-BHC	S16-My28406	CP	%	102			70-130	Pass	
Aldrin	S16-My28406	CP	%	116			70-130	Pass	
b-BHC	S16-My28406	CP	%	116			70-130	Pass	
d-BHC	S16-My28406	CP	%	119			70-130	Pass	
Dieldrin	S16-My28406	CP	%	106			70-130	Pass	
Endosulfan I	S16-My28406	CP	%	107			70-130	Pass	
Endosulfan II	S16-My28406	CP	%	107			70-130	Pass	
Endosulfan sulphate	S16-My28406	CP	%	103			70-130	Pass	
Endrin	S16-My28406	CP	%	103			70-130	Pass	
Endrin aldehyde	S16-My28406	CP	%	75			70-130	Pass	
Endrin ketone	S16-My28406	CP	%	116			70-130	Pass	
g-BHC (Lindane)	S16-My28406	CP	%	99			70-130	Pass	
Heptachlor	S16-My28406	CP	%	114			70-130	Pass	
Heptachlor epoxide	S16-My28406	CP	%	110			70-130	Pass	
Hexachlorobenzene	S16-My28406	CP	%	107			70-130	Pass	
Methoxychlor	S16-My28406	CP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My28406	CP	%	122			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	S16-My28419	CP	%	97			70-130	Pass	
Cadmium	S16-My28419	CP	%	96			70-130	Pass	
Chromium	S16-My28419	CP	%	77			70-130	Pass	
Mercury	S16-My28419	CP	%	100			70-130	Pass	
Nickel	S16-My28419	CP	%	86			70-130	Pass	
Zinc	S16-My28419	CP	%	112			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My28421	CP	%	70			70-130	Pass	
TRH C10-C14	S16-My28421	CP	%	97			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My28421	CP	%	90			70-130	Pass	
Toluene	S16-My28421	CP	%	90			70-130	Pass	
Ethylbenzene	S16-My28421	CP	%	89			70-130	Pass	
m&p-Xylenes	S16-My28421	CP	%	90			70-130	Pass	
o-Xylene	S16-My28421	CP	%	90			70-130	Pass	
Xylenes - Total	S16-My28421	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My28421	CP	%	88			70-130	Pass	
TRH C6-C10	S16-My28421	CP	%	77			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My28421	CP	%	97			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My28376	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My28376	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My28376	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My28376	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My28376	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My28376	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My28376	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My28376	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My28376	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My28376	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My28376	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My28376	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My28376	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My28376	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My28376	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-My28378	CP	mg/kg	0.22	0.25	10	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-My28378	CP	mg/kg	0.006	0.005	5.0	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My28378	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-My28380	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-My28380	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-My28380	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-My28380	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S16-My28380	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S16-My28380	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-My28380	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-My28380	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-My28380	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-My28380	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My28384	CP	mg/kg	5.2	6.8	27	30%	Pass	
Cadmium	S16-My28384	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-My28384	CP	mg/kg	11	12	13	30%	Pass	
Copper	S16-My28384	CP	mg/kg	13	13	4.0	30%	Pass	
Lead	S16-My28384	CP	mg/kg	10	13	27	30%	Pass	
Mercury	S16-My28384	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-My28384	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S16-My28384	CP	mg/kg	7.4	6.5	12	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(g.h.i)perylene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My28385	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My28385	CP	%	11	9.6	14	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My28386	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My28386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My28386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My28386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My28386	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My28386	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My28386	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My28386	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My28386	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-My28401	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-My28401	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-My28401	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S16-My28401	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S16-My28401	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-My28401	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-My28401	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-My28401	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-My28401	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My28401	CP	mg/kg	8.7	8.7	<1	30%	Pass	
Cadmium	S16-My28401	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-My28401	CP	mg/kg	18	15	14	30%	Pass	
Copper	S16-My28401	CP	mg/kg	15	15	4.0	30%	Pass	
Lead	S16-My28401	CP	mg/kg	21	33	44	30%	Fail	Q15
Mercury	S16-My28401	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-My28401	CP	mg/kg	5.0	5.8	14	30%	Pass	
Zinc	S16-My28401	CP	mg/kg	19	21	7.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My28403	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My28403	CP	%	20	20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My28405	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My28405	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My28405	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My28405	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My28405	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My28405	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My28405	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My28405	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My28405	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My28405	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My28405	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My28405	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My28405	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My28405	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My28405	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	S16-My28408	CP	%	48	48	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C)	S16-My29631	NCP	uS/cm	140	120	11	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My28416	CP	mg/kg	9.9	8.5	15	30%	Pass	
Cadmium	S16-My28416	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-My28416	CP	mg/kg	17	16	2.0	30%	Pass	
Copper	S16-My28416	CP	mg/kg	21	20	6.0	30%	Pass	
Lead	S16-My28416	CP	mg/kg	110	120	13	30%	Pass	
Mercury	S16-My28416	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-My28416	CP	mg/kg	9.5	11	19	30%	Pass	
Zinc	S16-My28416	CP	mg/kg	38	39	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My28420	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My28420	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My28420	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My28420	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My28420	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My28420	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My28420	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My28420	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My28420	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My28420	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My28420	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My28420	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My28420	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My28420	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My28420	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-My28420	CP	mg/kg	0.011	0.009	19	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-My28420	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My28420	CP	mg/kg	< 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

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
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear standard.
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Ivan Taylor	Senior Analyst-Metal (NSW)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Richard Corner	Senior Analyst-Inorganic (QLD)
Richard Corner	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (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

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	Michael Stacey
Report	502324-AID
Project Name	BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Received Date	May 27, 2016
Date Reported	Jun 06, 2016

Methodology:

Asbestos ID	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. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz 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) Iron ores - Sampling and Sample preparation procedures is employed. 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 and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name	BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Date Sampled	May 25, 2016 to May 27, 2016
Report	502324-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A1_TP01_0.0	16-My28378	May 25, 2016	Approximate Sample 872g 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.^{M11}
A1_TP04_0.0	16-My28386	May 26, 2016	Approximate Sample 798g 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.^{M11}
A1_TP05_0.3	16-My28388	May 26, 2016	Approximate Sample 861g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP05_ASB_0.3	16-My28389	May 26, 2016	Approximate Sample 28g / 80x60x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile, amosite and crocidolite asbestos detected.
A1_TP05_ASB_0.4	16-My28390	May 26, 2016	Approximate Sample 42g / 140x50x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile, amosite and crocidolite asbestos detected.
A1_TP09_0.2	16-My28392	May 26, 2016	Approximate Sample 843g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP09_ASB_0.2	16-My28393	May 26, 2016	Approximate Sample 60g / 140x65x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.
A1_TP09_ASB_0.4	16-My28394	May 26, 2016	Approximate Sample 119g / 111x60x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.
A1_TP12_0.0	16-My28398	May 26, 2016	Approximate Sample 806g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP12_ASB_0.4	16-My28399	May 26, 2016	Approximate Sample 30g / 60x40x7mm Sample consisted of: Grey compressed fibre cement material	Chrysotile and amosite asbestos detected.

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A1_TP14_0.0	16-My28401	May 26, 2016	Approximate Sample 809g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP14_ASB_0.2	16-My28402	May 26, 2016	Approximate Sample 13g / 55x41x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile, amosite and crocidolite asbestos detected.
A1_TP15_ASB_0.2	16-My28404	May 26, 2016	Approximate Sample 18g / 50x34x8mm Sample consisted of: Grey compressed fibre cement material	Chrysotile, amosite and crocidolite asbestos detected.
A1_TP02_0.2	16-My28407	May 27, 2016	Approximate Sample 988g 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.^{M11}
A1_TP06_0.0	16-My28409	May 27, 2016	Approximate Sample 761g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP07_0.0	16-My28411	May 27, 2016	Approximate Sample 838g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP08_0.3	16-My28413	May 27, 2016	Approximate Sample 888g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP08_ASB_0.4	16-My28414	May 27, 2016	Approximate Sample 19g / 80x25x5mm Sample consisted of: Assorted grey compressed fibre cement material	Chrysotile and amosite asbestos detected.
A1_TP11_0.0	16-My28416	May 27, 2016	Approximate Sample 101g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected. Organic fibre detected. No respirable fibres detected.
A1_TP11_0.3	16-My28417	May 27, 2016	Approximate Sample 1043g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}
A1_TP18_0.0	16-My28422	May 27, 2016	Approximate Sample 819g Sample consisted of: Brown coarse grain sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}

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	Jun 07, 2016	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Jun 07, 2016	Indefinite

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502324
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 27, 2016 7:50 PM
Due: Jun 6, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	A1_BH1_0.0	May 24, 2016		Soil	S16-My28376										X		X
2	A1_BH4_0.5	May 24, 2016		Soil	S16-My28377										X		X
3	A1_TP01_0.0	May 25, 2016		Soil	S16-My28378		X						X	X	X		X
4	A1_TP01_1.0	May 25, 2016		Soil	S16-My28379										X		X
5	A1_TP03_0.0	May 25, 2016		Soil	S16-My28380								X	X	X		X
6	A1_TP03_0.5	May 25, 2016		Soil	S16-My28381										X		X
7	A1_BH2_0.0	May 25, 2016		Soil	S16-My28382										X		X
8	A1_BH5_0.5	May 25, 2016		Soil	S16-My28383										X		X
9	A1_BH7_1.5	May 25, 2016		Soil	S16-My28384										X		X
10	A1_BH8_0.0	May 25, 2016		Soil	S16-My28385										X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
11	A1_TP04_0.0	May 26, 2016		Soil	S16-My28386		X								X		X
12	A1_TP05_0.0	May 26, 2016		Soil	S16-My28387								X	X	X		X
13	A1_TP05_0.3	May 26, 2016		Soil	S16-My28388		X										
14	A1_TP05_ASB_0.3	May 26, 2016		Soil	S16-My28389			X									
15	A1_TP05_ASB_0.4	May 26, 2016		Soil	S16-My28390			X									
16	A1_TP05_0.7	May 26, 2016		Soil	S16-My28391										X		X
17	A1_TP09_0.2	May 26, 2016		Soil	S16-My28392		X										
18	A1_TP09_ASB_0.2	May 26, 2016		Soil	S16-My28393			X									
19	A1_TP09_ASB_0.4	May 26, 2016		Soil	S16-My28394			X									

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Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
20	A1_TP09_0.5	May 26, 2016		Soil	S16-My28395										X		X
21	A1_TP10_0.0	May 26, 2016		Soil	S16-My28396								X	X	X		X
22	A1_TP10_2.0	May 26, 2016		Soil	S16-My28397										X		X
23	A1_TP12_0.0	May 26, 2016		Soil	S16-My28398		X						X	X	X		X
24	A1_TP12_ASB_0.4	May 26, 2016		Soil	S16-My28399			X									
25	A1_TP12_0.5	May 26, 2016		Soil	S16-My28400										X		X
26	A1_TP14_0.0	May 26, 2016		Soil	S16-My28401		X						X	X	X		X
27	A1_TP14_ASB_0.2	May 26, 2016		Soil	S16-My28402			X									
28	A1_TP14_1.0	May 26, 2016		Soil	S16-My28403										X		X
29	A1_TP15_ASB	May 26, 2016		Soil	S16-My28404			X									

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Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
	_0.2																
30	A1_TP15_0.5	May 26, 2016		Soil	S16-My28405										X		X
31	A1_TP02_0.0	May 27, 2016		Soil	S16-My28406								X	X	X		X
32	A1_TP02_0.2	May 27, 2016		Soil	S16-My28407		X										
33	A1_TP02_2.5	May 27, 2016		Soil	S16-My28408	X					X				X	X	X
34	A1_TP06_0.0	May 27, 2016		Soil	S16-My28409		X						X	X	X		X
35	A1_TP06_0.3	May 27, 2016		Soil	S16-My28410										X		X
36	A1_TP07_0.0	May 27, 2016		Soil	S16-My28411		X						X	X	X		X
37	A1_TP07_0.5	May 27, 2016		Soil	S16-My28412										X		X
38	A1_TP08_0.3	May 27, 2016		Soil	S16-My28413		X										
39	A1_TP08_ASB_0.4	May 27, 2016		Soil	S16-My28414			X									

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Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
40	A1_TP08_0.5	May 27, 2016		Soil	S16-My28415										X		X
41	A1_TP11_0.0	May 27, 2016		Soil	S16-My28416			X					X	X	X		X
42	A1_TP11_0.3	May 27, 2016		Soil	S16-My28417		X										
43	A1_TP11_ASB_0.4	May 27, 2016		Soil	S16-My28418				X								
44	A1_TP11_0.5	May 27, 2016		Soil	S16-My28419										X		X
45	A1_TP17_0.0	May 27, 2016		Soil	S16-My28420								X	X	X		X
46	A1_TP17_1.0	May 27, 2016		Soil	S16-My28421										X		X
47	A1_TP18_0.0	May 27, 2016		Soil	S16-My28422		X						X	X	X		X
48	A1_TP18_0.5	May 27, 2016		Soil	S16-My28423										X		X
49	TS160517_4	May 27, 2016		Soil	S16-My28424							X					
50	TB160517_4	May 27, 2016		Soil	S16-My28426							X					

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 27, 2016 7:50 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502324	**Due:**	Jun 6, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 1				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
51	A1_BH3_0.0	May 26, 2016		Soil	S16-My28427							X			X		
52	A1_BH6_0.5	May 26, 2016		Soil	S16-My28428							X			X		
53	A1_BH9_1.5	May 26, 2016		Soil	S16-My28429							X			X		
54	A1_BH10_0.0	May 26, 2016		Soil	S16-My28430							X			X		
55	A1_BH1_0.5	May 24, 2016		Soil	S16-My28431					X							
56	A1_BH1_1.5	May 24, 2016		Soil	S16-My28432					X							
57	A1_BH4_0.0	May 24, 2016		Soil	S16-My28433					X							
58	A1_BH4_1.5	May 24, 2016		Soil	S16-My28434					X							
59	A1_TP01_0.5	May 25, 2016		Soil	S16-My28435					X							
60	A1_TP03_1.0	May 25, 2016		Soil	S16-My28436					X							
61	A1_BH2_0.5	May 25, 2016		Soil	S16-My28437					X							

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 27, 2016 7:50 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502324	**Due:**	Jun 6, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
62	A1_BH2_1.5	May 25, 2016		Soil	S16-My28438					X							
63	A1_BH5_0.0	May 25, 2016		Soil	S16-My28439					X							
64	A1_BH5_1.5	May 25, 2016		Soil	S16-My28440					X							
65	A1_BH7_0.0	May 25, 2016		Soil	S16-My28441					X							
66	A1_BH7_0.5	May 25, 2016		Soil	S16-My28442					X							
67	A1_BH8_0.5	May 25, 2016		Soil	S16-My28443					X							
68	A1_BH8_1.5	May 25, 2016		Soil	S16-My28444					X							
69	A1_TP04_0.4	May 26, 2016		Soil	S16-My28445					X							
70	A1_TP04_0.6	May 26, 2016		Soil	S16-My28446					X							
71	A1_TP04_1.0	May 26, 2016		Soil	S16-My28447					X							
72	A1_TP04_2.0	May 26, 2016		Soil	S16-My28448					X							

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 27, 2016 7:50 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502324	**Due:**	Jun 6, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 1				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
73	A1_TP04_2.5	May 26, 2016		Soil	S16-My28449					X							
74	A1_TP05_1.0	May 26, 2016		Soil	S16-My28450					X							
75	A1_TP05_2.0	May 26, 2016		Soil	S16-My28451					X							
76	A1_TP05_2.5	May 26, 2016		Soil	S16-My28452					X							
77	A1_TP09_0.0	May 26, 2016		Soil	S16-My28453					X							
78	A1_TP09_0.7	May 26, 2016		Soil	S16-My28454					X							
79	A1_TP09_1.0	May 26, 2016		Soil	S16-My28455					X							
80	A1_TP10_0.5	May 26, 2016		Soil	S16-My28456					X							
81	A1_TP10_0.9	May 26, 2016		Soil	S16-My28457					X							
82	A1_TP10_1.1	May 26, 2016		Soil	S16-My28458					X							
83	A1_TP10_2.5	May 26, 2016		Soil	S16-My28459					X							

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502324
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 27, 2016 7:50 PM
Due: Jun 6, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
84	A1_TP12_0.8	May 26, 2016		Soil	S16-My28460					X							
85	A1_TP12_1.0	May 26, 2016		Soil	S16-My28461					X							
86	A1_TP12_2.0	May 26, 2016		Soil	S16-My28462					X							
87	A1_TP12_2.5	May 26, 2016		Soil	S16-My28463					X							
88	A1_TP14_0.5	May 26, 2016		Soil	S16-My28464					X							
89	A1_TP14_2.0	May 26, 2016		Soil	S16-My28465					X							
90	A1_TP14_2.5	May 26, 2016		Soil	S16-My28466					X							
91	A1_TP15_0.0	May 26, 2016		Soil	S16-My28467					X							
92	A1_TP15_0.8	May 26, 2016		Soil	S16-My28468					X							
93	A1_TP15_1.0	May 26, 2016		Soil	S16-My28469					X							
94	A1_TP02_0.5	May 27, 2016		Soil	S16-My28470					X							

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 27, 2016 7:50 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502324	**Due:**	Jun 6, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 1				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
95	A1_TP02_1.0	May 27, 2016		Soil	S16-My28471					X							
96	A1_TP02_2.0	May 27, 2016		Soil	S16-My28472					X							
97	A1_TP06_0.5	May 27, 2016		Soil	S16-My28473					X							
98	A1_TP06_1.0	May 27, 2016		Soil	S16-My28474					X							
99	A1_TP07_0.3	May 27, 2016		Soil	S16-My28475					X							
100	A1_TP07_1.0	May 27, 2016		Soil	S16-My28476					X							
101	A1_TP07_2.0	May 27, 2016		Soil	S16-My28477					X							
102	A1_TP07_2.5	May 27, 2016		Soil	S16-My28478					X							
103	A1_TP08_0.0	May 27, 2016		Soil	S16-My28479					X							
104	A1_TP08_0.8	May 27, 2016		Soil	S16-My28480					X							
105	A1_TP08_1.0	May 27, 2016		Soil	S16-My28481					X							

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502324
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 27, 2016 7:50 PM
Due: Jun 6, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
106	A1_TP08_2.0	May 27, 2016		Soil	S16-My28482					X							
107	A1_TP08_2.5	May 27, 2016		Soil	S16-My28483					X							
108	A1_TP11_ASB_0.3	May 27, 2016		Soil	S16-My28484				X								
109	A1_TP11_0.7	May 27, 2016		Soil	S16-My28485					X							
110	A1_TP11_1.0	May 27, 2016		Soil	S16-My28486					X							
111	A1_TP11_2.0	May 27, 2016		Soil	S16-My28487					X							
112	A1_TP11_2.5	May 27, 2016		Soil	S16-My28488					X							
113	A1_TP17_0.5	May 27, 2016		Soil	S16-My28489					X							
114	A1_TP18_0.8	May 27, 2016		Soil	S16-My28490					X							
115	A1_TP18_1.0	May 27, 2016		Soil	S16-My28491					X							
116	A1_BH3_0.5	May 26, 2016		Soil	S16-My28492					X							

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 27, 2016 7:50 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502324	**Due:**	Jun 6, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 1				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	Asbestos Absence /Presence	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271																X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X							X				
External Laboratory																	
117	A1_BH3_1.5	May 26, 2016		Soil	S16-My28493					X							
118	A1_BH6_0.0	May 26, 2016		Soil	S16-My28494					X							
119	A1_BH6_1.5	May 26, 2016		Soil	S16-My28495					X							
120	A1_BH9_0.0	May 26, 2016		Soil	S16-My28496					X							
121	A1_BH9_0.5	May 26, 2016		Soil	S16-My28497					X							
122	A1_BH10_0.5	May 26, 2016		Soil	S16-My28498					X							
123	A1_BH10_1.5	May 26, 2016		Soil	S16-My28499					X							
Test Counts						1	12	9	2	68	1	6	12	12	38	1	34

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas	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

eurofins | mgt

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

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Jacobs Group (Australia) P/L NSW**
Contact name:	Michael Stacey
Project name:	BANKSTOWN AIRPORT - SITE 1
Project ID:	IA110700
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 27, 2016 7:50 PM
Eurofins | mgt reference:	**502324**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Sample ID A1_TP11_ASB_0.3 not received, A1_TP11_ASB_0.4 duplicated on bag. Analysis cancelled until further client confirmation.

Contact notes

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

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

Results will be delivered electronically via e.mail to Michael Stacey - michael.stacey@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1, 21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600 E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company: Jacobs

Address: Level 4 100 Christie Street
St Leonards NSW 2065

Contact Name: Michael Stacey

Contact Phone №: 02 9032 1467

Special Direction:

Relinquished by (Signature): B. Cumming

(Time / Date): 19 : 10 27 / 05 / 16

Purchase Order: IA110700

Eurofins | mgt Quote №: 160413JACN

Project Manager: BLAIR CUMMINGS

Project №: IA110700

Project Name: Bankstown Airport - Site 1

Electronic Results Format: ESdat

Email for Results: Michael.Stacey@jacobs.com, Blair.Cumming@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5 DAY (Std.) ☐ Other ( )

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

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1-BH1_0.0	24/05/16	Soil		X																						
2	A1-BH1_0.5																										
3	A1-BH1_1.5																										
4	A1-BH4_0.0																										
5	A1-BH4_0.5	↓			X																						
6	A1-BH4_1.5	24/05/16																									
7	A1_TP01_0.0	25/05/16			X	X	X	X																			
8	A1-TP01_0.5																										
9	A1-TP01_1.0				X																						
10	A1-TP03_0.0				X	X	X																				
11	A1-TP03_0.5	↓			X																						
12	A1-TP03_1.0	25/05/16	↓																								502324

Laboratory Use Only

Received By Ellen Ng [✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR Date 27/05/16 Time 19.50 Signature

Received By SYD | BNE | MEL | PER | ADL | NEW | DAR Date __/__/__ Time ___ Signature

Temperature 0.3.

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

Page 1 of 11

CHAIN OF CUSTODY RECORD
ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F, 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1,21 Smallwood Place, Murarrie, QLD 4172 P +617 3902 4600 E
EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company: Jacobs
Address: Level 4 100 Christie Street
St Leonards NSW 2065
Contact Name: Michael Stacey
Contact Phone №: 02 9032 1467
Special Direction:
Relinquished by: B.Cummings
(Signature)
(Time / Date): 17:10 27/05/16

Purchase Order: IA110700
Eurofins | mgt Quote №: 160413JACN
Project Manager: BLAIR CUMMINGS
Project №: IA110700
Project Name: Bankstown Airport - Site 1
Electronic Results Format: ESdat
Email for Results: Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis (Note: where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A1-BH2_0.0	25/05/16	Soil	[illegible]	X																				
2	A1-BH2_0.5	↓	↓																						
3	A1-BH2_1.5																								
4	A1-BH5_0.0																								
5	A1-BH5_0.5				X																				
6	A1-BH5_1.5																								
7	A1-BH7_0.0																								
8	A1-BH7_0.5																								
9	A1-BH7_1.5				X																				
10	A1-BH8_0.0				X																				
11	A1-BH8_0.5																								
12	A1-BH8_1.5	↓	↓																						

Laboratory Use Only									
	Received By	Ellen Ng	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	12:50	Signature	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time		Signature	Report №

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CHAIN OF CUSTODY RECORD

ABN 50005085521

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☐ Eurofins | mgt Brisbane Lab
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☐ Eurofins | mgt Melbourne Lab
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E: EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS	Project Name	Bankstown Airport - Site 1
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone №	02 9032 1467					Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Special Direction						Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
Relinquished by (Signature) (Time / Date)	B. Cummings 19:10 27/05/16						

№	Client Sample ID	Date	Matrix	Soil Asbestos ID	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			Containers 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1-TP04_0.0	26/05/16	Soil		X			X																		
2	A1-TP04_0.4	↓	↓																							
3	A1-TP04_0.6																									
4	A1-TP04_1.0																									
5	A1-TP04_2.0																									
6	A1-TP04_2.5																									
7	A1-TP05_0.0				X	X	X																			
8	A1-TP05_0.3							X																		
9	A1-TP05_ASB_0.3			X																						
10	A1-TP05_ASB_0.4			X																						
11	A1-TP05_0.7				X																					
12	A1-TP05_1.0	↓	↓																							

Laboratory Use Only	Received By	Eh92	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	19:50	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report №	

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CHAIN OF CUSTODY RECORD

ABN 50005085521

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E EnviroSampleVic@eurofins.com.au

Company	Jacobs	**Purchase Order**	IA110700	**Project Manager**	BLAIR CUMMINGS
Address	Level 4 100 Christie Street St Leonards NSW 2065	**Eurofins | mgt Quote №**	160413JACN	**Project №**	IA110700
Contact Name	Michael Stacey			**Project Name**	Bankstown Airport - Site 1
Contact Phone №	02 9032 1467			**Electronic Results Format**	ESdat
Special Direction				**Email for Results**	Michael.Stacey@jacobs.com, Blair.Cumming@jacobs.com
Relinquished by	B.Cummings			**Turn Around Requirements**	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
(Signature)				**Method of Shipment**	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
(Time / Date)	19:10 27/05/16				

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil Asbestos ID	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			Containers 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1-TP05_2.0	26/05/16	Soil																							
2	A1_TP05_2.5	↓	↓																							
3	A1-TP09_0.0	↓	↓																							
4	A1-TP09_0.2	↓	↓					X																		
5	A1-TP09_ASB_0.2	↓	↓	X																						
6	A1-TP09_ASB_0.4	↓	↓	X																						
7	A1-TP09_0.5	↓	↓		X																					
8	A1-TP09_0.7	↓	↓																							
9	A1-TP09-1.0	↓	↓																							
10	A1-TP10-0.0	↓	↓		X	X	X																			
11	A1-TP10-0.5	↓	↓																							
12	A1-TP10_0.9	↓	↓																							

Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	12:50	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report №	

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS	Project Name	Bankstown Airport - Site 1
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone №	02 9032 1467					Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY(Std) ☐ Other( )
Special Direction						Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
Relinquished by (Signature) (Time / Date)	B.Cummings 19:10 27/05/16						

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil Asbestos ID	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1-TP10-1.1	26/05/16	Soil																								
2	A1-TP10-2.0				X																						
3	A1-TP10-2.5																										
4	A1-TP12-0.0				X	X	X	X																			
5	A1-TP12-ASB-0.4			X																							
6	A1-TP12-0.5				X																						
7	A1-TP12-0.8																										
8	A1-TP12-1.0																										
9	A1-TP12-2.0																										
10	A1-TP12-2.5																										
11	A1-TP14-0.0				X	X	X	X																			
12	A1-TP14-ASB-0.2			X																							

Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	1250	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report №

QS099_R0 Modified by [illegible] Approved by [illegible] Approved on [illegible]

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CHAIN OF CUSTODY RECORD

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E EnviroSampleVic@eurofins.com.au

Company	Jacobs	**Purchase Order**	IA110700	**Project Manager**	BLAIR CUMMINGS
Address	Level 4 100 Christie Street St Leonards NSW 2065	**Eurofins | mgt Quote №**	160413JACN	**Project №**	IA110700
Contact Name	Michael Stacey			**Project Name**	Bankstown Airport - Site 1
Contact Phone №	02 9032 1467			**Electronic Results Format**	ESdat
Special Direction				**Email for Results**	Michael.Stacey@jacobs.com, Blair.Cumming@jacobs.com
Relinquished by (Signature) (Time / Date)	B. Cumming 19 10 27/05/16			**Turn Around Requirements**	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
				Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Soil Asbestos ID	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				Containers 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A1-TP14_0.5	26/05/16	Soil																							
2	A1-TP14_1.0				X																					
3	A1-TP14_2.0																									
4	A1-TP14_2.5																									
5	A1-TP15_0.0																									
6	A1-TP15_ASB_0.2			X																						
7	A1-TP15_0.5				X																					
8	A1-TP15_0.8	↓																								
9	A1-TP15_1.0	26/05/16																								
10	A1-TP02_0.0	27/05/16			X	X	X																			
11	A1-TP02_0.2	27/05/16	↓					X																		
12	A1-TP02_0.5	27/05/16	Soil																							

Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/5/16	Time	1250	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report №	

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CHAIN OF CUSTODY RECORD

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Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by (Signature) (Time / Date)	B.Cummings 19 : 10 27 / 05 / 16
Purchase Order	IA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	IA110700
Project Name	Bankstown Airport - Site 1
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY(Std) ☐ Other ( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				Containers								Sample Comments / DG Hazard Warning
																			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		
1	A1-TP02_1.0	28/05/16	Soil																								
2	A1-TP02_2.0																										
3	A1-TP02_2.5				X				X	X	X																
4	A1-TP06_0.0				X	X	X	X																			
5	A1-TP06_0.3				X																						
6	A1-TP06_0.5																										
7	A1-TP06_1.0																										
8	A1-TP07_0.0				X	X	X	X																			
9	A1-TP07_0.3																										
10	A1-TP07_0.5				X																						
11	A1-TP07_1.0																										
12	A1-TP07_2.0																										

Laboratory Use Only								
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	12:50	Signature	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature	Report №

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Company: Jacobs

Address:
Level 4 100 Christie Street
St Leonards NSW 2065

Contact Name: Michael Stacey

Contact Phone No: 02 9032 1467

Special Direction:

Relinquished by (Signature): B. Cummings

(Time / Date): 19 : 10 27 / 05 / 16

Purchase Order: IA110700

Eurofins | mgt Quote No: 160413JACN

Project Manager: BLAIR CUMMINGS

Project No: IA110700

Project Name: Bankstow Airport - Site 1

Electronic Results Format: ESdat

Email for Results: Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

No	Client Sample ID	Date	Matrix	Soil Asbestos ID	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A1-TP07-2.5	27/05/16	Soil																						
2	A1-TP08-0.0																								
3	A1-TP08-0.3							X																	
4	A1-TP08_ASB_0.4			X																					
5	A1_TP08_0.5				X																				
6	A1-TP08-0.8																								
7	A1-TP08-1.0																								
8	A1-TP08-2.0																								
9	A1-TP08-2.5																								
10	A1-TP11-0.0			X	X	X	X																		
11	A1-TP11_ASB_0.3																								
12	A1-TP11-0.3							X																	

Laboratory Use Only

Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	12:50	Signature		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report No	

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Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone No	02 9032 1467
Special Direction	
Relinquished by	B.Cummings
(Signature)	
(Time / Date)	11:10 27/05/16
Purchase Order	IA110700
Eurofins | mgt Quote No	160413JACN
Project Manager	BLAIR CUMMINGS
Project No	
Project Name	Bankstown Airport - Site 1
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

No	Client Sample ID	Date	Matrix	Soil Asbestos ID	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A1-TP11-ASB_0.4	27/05/16	Soil	X																					
2	A1-TP11-0.5				X																				
3	A1-TP11-0.7																								
4	A1-TP11-1.0																								
5	A1-TP11-2.0																								
6	A1_TP11-2.5																								
7	A1-TP17-0.0				X	X	X																		
8	A1-TP17-0.5																								
9	A1-TP17-1.0				X																				
10	A1-TP18-0.0				X	X	X	X																	
11	A1-TP18-0.5				X																				
12	A1-TP18_0.8																								

Laboratory Use Only	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27 05 16	Time	12 50	Signature	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature	Report No	

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by (Signature)	B. Cumming
(Time / Date)	19 : 10 21 / 05 / 16
Purchase Order	JA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	JA110700
Project Name	Bankstown Airport - Site 1
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )

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

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil BTEX	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1-TP18_1.0	27/05/16	Soil																								
2	TS 160517-4	27/05/16	Soil	X																							
3	TB 160517-4	27/05/16	Soil	X																							
4	A1-BH03_0.0	26/05/16	↓	X																							
5	A1-BH03_0.5	↓																									
6	A1-BH03_1.5																										
7	A1-BH06_0.0																										
8	A1-BH06_0.5			X																							
9	A1-BH06_1.5																										
10	A1-BH9_0.0																										
11	A1-BH9_0.5																										
12	A1-BH9_1.5	↓	↓	X																							

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	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature	Report №	

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CHAIN OF CUSTODY RECORD

ABN 50005085521

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E EnviroSampleVic@eurofins.com.au

Company	Jacobs	**Purchase Order**	IA110700
Address	Level 4 100 Christie Street St Leonards NSW 2065	**Eurofins | mgt Quote No**	160413JACN
Contact Name	Michael Stacey	**Project Manager**	BLAIR CUMMINGS
Contact Phone No	02 9032 1467	**Project No**	IA110700
Special Direction		**Project Name**	Bankstown Airport - Site 1
Relinquished by	B.Cummings	**Electronic Results Format**	ESdat
(Signature)		**Email for Results**	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
(Time / Date)	19:10 27/05/16		

Turn Around Requirements: ☐ 1 DAY* ☐ 2 DAY* ☐ 3 DAY* ☑ 5 DAY (Std) ☐ Other ( )

* Surcharges apply

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

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

No	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1-BH10_0.0	26/05/16	Soil		X																						
2	A1-B10_0.5	26/05/16	Soil																								
3	A1-BH10_1.5	26/05/16	Soil																								
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											
12																											

502324

Laboratory Use Only										
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	27/05/16	Time	19:50	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report No

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

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention: **Blair Cummings**

Report **502800-S**
Project name BANKSTOWN AIRPORT - SITE 1
Project ID IA110700
Received Date Jun 01, 2016

Client Sample ID			**A1_TP13_0.0**	**A1_TP13_0.4**	**A1_TP16_0.0**	**A1_TP16_1.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01280**	**S16-Jn01281**	**S16-Jn01282**	**S16-Jn01283**
Date Sampled			**May 30, 2016**	**May 30, 2016**	**May 30, 2016**	**May 30, 2016**
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	150	< 50	77	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	170	< 50
TRH C10-36 (Total)	50	mg/kg	150	< 50	247	< 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	%	94	51	53	50
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	1.6	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.8	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	2.1	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	0.6	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	1.2	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	1.2	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	1.1	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	0.8	< 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	1.0	< 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	0.9	< 0.5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP13_0.0** **Soil** **S16-Jn01280** **May 30, 2016**	**A1_TP13_0.4** **Soil** **S16-Jn01281** **May 30, 2016**	**A1_TP16_0.0** **Soil** **S16-Jn01282** **May 30, 2016**	**A1_TP16_1.0** **Soil** **S16-Jn01283** **May 30, 2016**
Polycyclic Aromatic Hydrocarbons						
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	1.0	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	8.7	< 0.5
2-Fluorobiphenyl (surr.)	1	%	104	93	96	97
p-Terphenyl-d14 (surr.)	1	%	104	102	111	90
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	102	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	122	-	98	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	102	-	144	-
Tetrachloro-m-xylene (surr.)	1	%	122	-	98	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	180	< 100	180	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP13_0.0** **Soil** **S16-Jn01280** **May 30, 2016**	**A1_TP13_0.4** **Soil** **S16-Jn01281** **May 30, 2016**	**A1_TP16_0.0** **Soil** **S16-Jn01282** **May 30, 2016**	**A1_TP16_1.0** **Soil** **S16-Jn01283** **May 30, 2016**
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	[N09]0.030	-	[N09]0.012	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	< 0.01	-
13C-PFHxA (surr.)	1	%	97	-	100	-
13C8-PFOS (surr.)	1	%	107	-	108	-
Heavy Metals						
Arsenic	2	mg/kg	4.0	< 2	4.4	8.7
Cadmium	0.4	mg/kg	6.2	0.6	< 0.4	< 0.4
Chromium	5	mg/kg	34	< 5	19	28
Copper	5	mg/kg	24	< 5	24	14
Lead	5	mg/kg	34	< 5	30	10
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.6	< 5	22	6.4
Zinc	5	mg/kg	57	< 5	45	6.7
% Moisture	1	%	6.0	1.2	5.7	23

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP19_0.0** **Soil** **S16-Jn01284** **May 30, 2016**	**A1_TP20_0.0** **Soil** **S16-Jn01286** **May 30, 2016**	**A1_TP20_2.0** **Soil** **S16-Jn01287** **May 30, 2016**	**A1-QC01** **Soil** **S16-Jn01288** **May 30, 2016**
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	%	51	54	58	52
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP19_0.0** **Soil** **S16-Jn01284** **May 30, 2016**	**A1_TP20_0.0** **Soil** **S16-Jn01286** **May 30, 2016**	**A1_TP20_2.0** **Soil** **S16-Jn01287** **May 30, 2016**	**A1-QC01** **Soil** **S16-Jn01288** **May 30, 2016**
Polycyclic Aromatic Hydrocarbons						
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	%	90	93	92	95
p-Terphenyl-d14 (surr.)	1	%	88	99	95	96
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Dibutylchlorendate (surr.)	1	%	-	111	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	132	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1_TP19_0.0** **Soil** **S16-Jn01284** **May 30, 2016**	**A1_TP20_0.0** **Soil** **S16-Jn01286** **May 30, 2016**	**A1_TP20_2.0** **Soil** **S16-Jn01287** **May 30, 2016**	**A1-QC01** **Soil** **S16-Jn01288** **May 30, 2016**
Polychlorinated Biphenyls						
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	111	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	132	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	< 0.005	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	< 0.005	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	< 0.01	-	-
13C-PFHxA (surr.)	1	%	-	95	-	-
13C8-PFOS (surr.)	1	%	-	108	-	-
Heavy Metals						
Arsenic	2	mg/kg	5.1	4.1	3.9	6.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.5
Chromium	5	mg/kg	9.9	9.4	13	12
Copper	5	mg/kg	9.7	11	10	9.1
Lead	5	mg/kg	48	15	8.2	51
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.3	6.6	< 5	6.0
Zinc	5	mg/kg	21	17	7.3	20
% Moisture	1	%	6.9	8.3	17	9.4

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1-QC03** **Soil** **S16-Jn01289** **May 30, 2016**	**A1-QC05** **Soil** **S16-Jn01290** **May 30, 2016**	**TS160517-5** **Soil** **S16-Jn01291** **May 30, 2016**	**TB160517-5** **Soil** **S16-Jn01293** **May 30, 2016**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	< 50	< 50	-	-
TRH C29-C36	50	mg/kg	52	< 50	-	-
TRH C10-36 (Total)	50	mg/kg	52	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	107%	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	123%	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	123%	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	121%	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	122%	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	121%	< 0.3
4-Bromofluorobenzene (surr.)	1	%	69	67	83	90

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1-QC03** **Soil** **S16-Jn01289** **May 30, 2016**	**A1-QC05** **Soil** **S16-Jn01290** **May 30, 2016**	**TS160517-5** **Soil** **S16-Jn01291** **May 30, 2016**	**TB160517-5** **Soil** **S16-Jn01293** **May 30, 2016**
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	94	86	-	-
p-Terphenyl-d14 (surr.)	1	%	89	88	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	< 100	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
Heavy Metals						
Arsenic	2	mg/kg	7.3	< 2	-	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	-
Chromium	5	mg/kg	20	< 5	-	-
Copper	5	mg/kg	25	< 5	-	-
Lead	5	mg/kg	25	< 5	-	-
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	-
Nickel	5	mg/kg	21	< 5	-	-
Zinc	5	mg/kg	34	< 5	-	-
% Moisture	1	%	17	3.1	-	-

Sample History

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

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

Description	**Testing Site**	**Extracted**	**Holding Time**
Eurofins | mgt Suite B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 02, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 02, 2016	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Jun 02, 2016	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Melbourne	Jun 02, 2016	14 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Polychlorinated Biphenyls	Melbourne	Jun 02, 2016	28 Day
- Method: USEPA 8082 Polychlorinated Biphenyls			
PFOS/PFOA/6:2FTS	Brisbane	Jun 06, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
% Moisture	Melbourne	Jun 01, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Order No.: IA110700
Report #: 502800
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	A1_TP13_0.0	May 30, 2016		Soil	S16-Jn01280	X			X	X	X	X
2	A1_TP13_0.4	May 30, 2016		Soil	S16-Jn01281						X	X
3	A1_TP16_0.0	May 30, 2016		Soil	S16-Jn01282	X			X	X	X	X
4	A1_TP16_1.0	May 30, 2016		Soil	S16-Jn01283						X	X
5	A1_TP19_0.0	May 30, 2016		Soil	S16-Jn01284						X	X
6	A1_TP19_0.3	May 30, 2016		Soil	S16-Jn01285	X						
7	A1_TP20_0.0	May 30, 2016		Soil	S16-Jn01286				X	X	X	X
8	A1_TP20_2.0	May 30, 2016		Soil	S16-Jn01287						X	X
9	A1-QC01	May 30, 2016		Soil	S16-Jn01288						X	X
10	A1-QC03	May 30, 2016		Soil	S16-Jn01289						X	X

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Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
11	A1-QC05	May 30, 2016		Soil	S16-Jn01290						X	X
12	TS160517-5	May 30, 2016		Soil	S16-Jn01291			X				
13	TSLAB160517-5	May 30, 2016		Soil	S16-Jn01292			X				
14	TB160517-5	May 30, 2016		Soil	S16-Jn01293			X				
15	A1_TP13_1.0	May 30, 2016		Soil	S16-Jn01294		X					
16	A1_TP13_2.0	May 30, 2016		Soil	S16-Jn01295		X					
17	A1_TP13_2.5	May 30, 2016		Soil	S16-Jn01296		X					
18	A1_TP16_0.5	May 30, 2016		Soil	S16-Jn01297		X					
19	A1_TP16_0.8	May 30, 2016		Soil	S16-Jn01298		X					
20	A1_TP16_2.0	May 30, 2016		Soil	S16-Jn01299		X					
21	A1_TP16_2.5	May 30, 2016		Soil	S16-Jn01300		X					

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Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
22	A1_TP19_0.5	May 30, 2016		Soil	S16-Jn01301		X					
23	A1_TP19_1.0	May 30, 2016		Soil	S16-Jn01302		X					
24	A1_TP19_2.0	May 30, 2016		Soil	S16-Jn01303		X					
25	A1_TP19_2.5	May 30, 2016		Soil	S16-Jn01304		X					
26	A1_TP20_0.5	May 30, 2016		Soil	S16-Jn01305		X					
27	A1_TP20_0.8	May 30, 2016		Soil	S16-Jn01306		X					
28	A1_TP20_1.1	May 30, 2016		Soil	S16-Jn01307		X					
29	A1_TP20_2.5	May 30, 2016		Soil	S16-Jn01308		X					
Test Counts						3	15	3	3	3	10	10

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram
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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%

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	
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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	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	%	98			70-130	Pass	
TRH C10-C14	%	114			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	84			70-130	Pass	
Toluene	%	85			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	84			70-130	Pass	
Xylenes - Total	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	80			70-130	Pass	
TRH C6-C10	%	92			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	%	92			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	95			70-130	Pass	
Benz(a)anthracene	%	85			70-130	Pass	
Benzo(a)pyrene	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	%	89			70-130	Pass	
Benzo(g.h.i)perylene	%	76			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	96			70-130	Pass	
Fluoranthene	%	83			70-130	Pass	
Fluorene	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	82			70-130	Pass	
Naphthalene	%	90			70-130	Pass	
Phenanthrene	%	95			70-130	Pass	
Pyrene	%	82			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	110			70-130	Pass	
4.4'-DDE	%	102			70-130	Pass	
4.4'-DDT	%	89			70-130	Pass	
a-BHC	%	117			70-130	Pass	
Aldrin	%	116			70-130	Pass	
b-BHC	%	106			70-130	Pass	
d-BHC	%	107			70-130	Pass	
Dieldrin	%	116			70-130	Pass	
Endosulfan I	%	116			70-130	Pass	
Endosulfan II	%	109			70-130	Pass	
Endosulfan sulphate	%	105			70-130	Pass	
Endrin	%	85			70-130	Pass	
Endrin aldehyde	%	107			70-130	Pass	
Endrin ketone	%	121			70-130	Pass	
g-BHC (Lindane)	%	120			70-130	Pass	
Heptachlor	%	119			70-130	Pass	
Heptachlor epoxide	%	114			70-130	Pass	
Hexachlorobenzene	%	109			70-130	Pass	
Methoxychlor	%	95			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	110			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	111			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	110			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	101			80-120	Pass	
Cadmium	%	105			80-120	Pass	
Chromium	%	109			80-120	Pass	
Copper	%	112			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead			%	107			80-120	Pass	
Mercury			%	111			75-125	Pass	
Nickel			%	106			80-120	Pass	
Zinc			%	112			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Jn01914	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Jn01914	NCP	%	83			70-130	Pass	
TRH C6-C10	S16-Jn01914	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	B16-Jn00475	NCP	%	127			70-130	Pass	
4.4'-DDE	B16-Jn00475	NCP	%	107			70-130	Pass	
4.4'-DDT	B16-Jn00475	NCP	%	89			70-130	Pass	
a-BHC	B16-Jn00475	NCP	%	115			70-130	Pass	
Aldrin	B16-Jn00475	NCP	%	123			70-130	Pass	
b-BHC	B16-Jn00475	NCP	%	122			70-130	Pass	
d-BHC	B16-Jn00475	NCP	%	108			70-130	Pass	
Dieldrin	B16-Jn00475	NCP	%	123			70-130	Pass	
Endosulfan I	B16-Jn00475	NCP	%	118			70-130	Pass	
Endosulfan II	B16-Jn00475	NCP	%	113			70-130	Pass	
Endosulfan sulphate	B16-Jn00475	NCP	%	105			70-130	Pass	
Endrin	B16-Jn00475	NCP	%	81			70-130	Pass	
Endrin aldehyde	B16-Jn00475	NCP	%	110			70-130	Pass	
Endrin ketone	B16-Jn00475	NCP	%	128			70-130	Pass	
g-BHC (Lindane)	B16-Jn00475	NCP	%	116			70-130	Pass	
Heptachlor	B16-Jn00475	NCP	%	119			70-130	Pass	
Heptachlor epoxide	B16-Jn00475	NCP	%	119			70-130	Pass	
Hexachlorobenzene	B16-Jn00475	NCP	%	103			70-130	Pass	
Methoxychlor	B16-Jn00475	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	B16-My30645	NCP	%	103			70-130	Pass	
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanesulfonic acid (PFOS)	S16-Jn01232	NCP	%	129			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S16-Jn01232	NCP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-Jn01232	NCP	%	108			50-150	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Jn01283	CP	%	103			70-130	Pass	
Acenaphthylene	S16-Jn01283	CP	%	102			70-130	Pass	
Anthracene	S16-Jn01283	CP	%	109			70-130	Pass	
Benz(a)anthracene	S16-Jn01283	CP	%	87			70-130	Pass	
Benzo(a)pyrene	S16-Jn01283	CP	%	99			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Jn01283	CP	%	105			70-130	Pass	
Benzo(g.h.i)perylene	S16-Jn01283	CP	%	82			70-130	Pass	
Benzo(k)fluoranthene	S16-Jn01283	CP	%	128			70-130	Pass	
Chrysene	S16-Jn01283	CP	%	114			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a.h)anthracene	S16-Jn01283	CP	%	93			70-130	Pass	
Fluoranthene	S16-Jn01283	CP	%	90			70-130	Pass	
Fluorene	S16-Jn01283	CP	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn01283	CP	%	75			70-130	Pass	
Naphthalene	S16-Jn01283	CP	%	99			70-130	Pass	
Phenanthrene	S16-Jn01283	CP	%	99			70-130	Pass	
Pyrene	S16-Jn01283	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S16-Jn01284	CP	%	122			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Jn01284	CP	%	115			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Jn01284	CP	%	95			75-125	Pass	
Cadmium	S16-Jn01284	CP	%	94			75-125	Pass	
Chromium	S16-Jn01284	CP	%	103			75-125	Pass	
Copper	S16-Jn01284	CP	%	90			75-125	Pass	
Lead	S16-Jn01284	CP	%	101			75-125	Pass	
Mercury	S16-Jn01284	CP	%	77			70-130	Pass	
Nickel	S16-Jn01284	CP	%	90			75-125	Pass	
Zinc	S16-Jn01284	CP	%	99			75-125	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My30327	NCP	%	85			70-130	Pass	
Toluene	S16-My30327	NCP	%	85			70-130	Pass	
Ethylbenzene	S16-My30327	NCP	%	82			70-130	Pass	
m&p-Xylenes	S16-My30327	NCP	%	83			70-130	Pass	
o-Xylene	S16-My30327	NCP	%	83			70-130	Pass	
Xylenes - Total	S16-My30327	NCP	%	83			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M16-Jn02075	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M16-Jn02075	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M16-Jn02075	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin aldehyde	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M16-Jn00082	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M16-Jn00082	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M16-Jn00082	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-Jn01229	NCP	mg/kg	0.035	0.034	5.0	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-Jn01229	NCP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-Jn01229	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	M16-Jn05850	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M16-Jn01089	NCP	%	25	25	2.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Jn01282	CP	mg/kg	0.6	0.7	26	30%	Pass	
Benzo(a)pyrene	S16-Jn01282	CP	mg/kg	1.2	1.5	23	30%	Pass	
Benzo(b&j)fluoranthene	S16-Jn01282	CP	mg/kg	1.2	1.4	16	30%	Pass	
Benzo(g.h.i)perylene	S16-Jn01282	CP	mg/kg	1.1	1.2	6.0	30%	Pass	
Benzo(k)fluoranthene	S16-Jn01282	CP	mg/kg	0.9	1.1	17	30%	Pass	
Chrysene	S16-Jn01282	CP	mg/kg	0.8	0.9	13	30%	Pass	
Dibenz(a.h)anthracene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Jn01282	CP	mg/kg	1.0	1.2	25	30%	Pass	
Fluorene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn01282	CP	mg/kg	0.9	1.0	9.0	30%	Pass	
Naphthalene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Jn01282	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Jn01282	CP	mg/kg	1.0	1.3	23	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S16-Jn01283	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-Jn01283	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-Jn01283	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Jn01283	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-Jn01283	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-Jn01283	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Jn01283	CP	mg/kg	8.7	8.1	7.0	30%	Pass	
Cadmium	S16-Jn01283	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Jn01283	CP	mg/kg	28	28	<1	30%	Pass	
Copper	S16-Jn01283	CP	mg/kg	14	14	1.0	30%	Pass	
Lead	S16-Jn01283	CP	mg/kg	10	7.0	36	30%	Fail	Q15
Nickel	S16-Jn01283	CP	mg/kg	6.4	5.6	14	30%	Pass	
Zinc	S16-Jn01283	CP	mg/kg	6.7	5.4	21	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Jn01284	CP	mg/kg	5.1	3.9	26	30%	Pass	
Cadmium	S16-Jn01284	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Jn01284	CP	mg/kg	9.9	9.7	2.0	30%	Pass	
Copper	S16-Jn01284	CP	mg/kg	9.7	9.7	<1	30%	Pass	
Lead	S16-Jn01284	CP	mg/kg	48	49	1.0	30%	Pass	
Nickel	S16-Jn01284	CP	mg/kg	6.3	6.0	5.0	30%	Pass	
Zinc	S16-Jn01284	CP	mg/kg	21	20	1.0	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My30326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My30326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My30326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My30326	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My30326	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My30326	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear standard.
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Mele Singh	Senior Analyst-Organic (VIC)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Richard Corner	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Volatile (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

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	Blair Cummings
Report	502800-AID
Project Name	BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Received Date	Jun 01, 2016
Date Reported	Jun 08, 2016

Methodology:

Asbestos ID	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. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz 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) Iron ores - Sampling and Sample preparation procedures is employed. 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 and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, "Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise" therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name	BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Date Sampled	May 30, 2016
Report	502800-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A1_TP13_0.0	16-Jn01280	May 30, 2016	Approximate Sample 910g 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.[M11]
A1_TP16_0.0	16-Jn01282	May 30, 2016	Approximate Sample 1019g 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.[M11]
A1_TP19_0.3	16-Jn01285	May 30, 2016	Approximate Sample 1164g Sample consisted of: Pale grey fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 01, 2016	Indefinite

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502800
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	A1_TP13_0.0	May 30, 2016		Soil	S16-Jn01280	X			X	X	X	X
2	A1_TP13_0.4	May 30, 2016		Soil	S16-Jn01281						X	X
3	A1_TP16_0.0	May 30, 2016		Soil	S16-Jn01282	X			X	X	X	X
4	A1_TP16_1.0	May 30, 2016		Soil	S16-Jn01283						X	X
5	A1_TP19_0.0	May 30, 2016		Soil	S16-Jn01284						X	X
6	A1_TP19_0.3	May 30, 2016		Soil	S16-Jn01285	X						
7	A1_TP20_0.0	May 30, 2016		Soil	S16-Jn01286				X	X	X	X
8	A1_TP20_2.0	May 30, 2016		Soil	S16-Jn01287						X	X
9	A1-QC01	May 30, 2016		Soil	S16-Jn01288						X	X
10	A1-QC03	May 30, 2016		Soil	S16-Jn01289						X	X

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
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NSW 2065

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Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
11	A1-QC05	May 30, 2016		Soil	S16-Jn01290						X	X
12	TS160517-5	May 30, 2016		Soil	S16-Jn01291			X				
13	TB160517-5	May 30, 2016		Soil	S16-Jn01293			X				
14	A1_TP13_1.0	May 30, 2016		Soil	S16-Jn01294		X					
15	A1_TP13_2.0	May 30, 2016		Soil	S16-Jn01295		X					
16	A1_TP13_2.5	May 30, 2016		Soil	S16-Jn01296		X					
17	A1_TP16_0.5	May 30, 2016		Soil	S16-Jn01297		X					
18	A1_TP16_0.8	May 30, 2016		Soil	S16-Jn01298		X					
19	A1_TP16_2.0	May 30, 2016		Soil	S16-Jn01299		X					
20	A1_TP16_2.5	May 30, 2016		Soil	S16-Jn01300		X					
21	A1_TP19_0.5	May 30, 2016		Soil	S16-Jn01301		X					

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Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
22	A1_TP19_1.0	May 30, 2016		Soil	S16-Jn01302		X					
23	A1_TP19_2.0	May 30, 2016		Soil	S16-Jn01303		X					
24	A1_TP19_2.5	May 30, 2016		Soil	S16-Jn01304		X					
25	A1_TP20_0.5	May 30, 2016		Soil	S16-Jn01305		X					
26	A1_TP20_0.8	May 30, 2016		Soil	S16-Jn01306		X					
27	A1_TP20_1.1	May 30, 2016		Soil	S16-Jn01307		X					
28	A1_TP20_2.5	May 30, 2016		Soil	S16-Jn01308		X					
Test Counts						3	15	2	3	3	10	10

Internal Quality Control Review and Glossary

General

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas	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

Sample Receipt Advice

Company name: **Jacobs Group (Australia) P/L NSW**

Contact name: Blair Cummings
Project name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Jun 1, 2016 3:45 PM
Eurofins | mgt reference: **502800**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

A1-QC02, A1-QC04, A1-QC06 forwarded to ALS.

Contact notes

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

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

Results will be delivered electronically via e.mail to Blair Cummings - Blair.Cummings@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1 21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600 E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +613 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	Blair Cumming
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins|mgt Quote №	160413JACN	Project №	IA110700
Contact Name	Michael Stacey				
Contact Phone №	02 9032 1467				
Special Direction					
Relinquished by (Signature)	B. Cumming				
(Time / Date)	17:10 21/06/16				

Project Name: Bankstown Airport - Site 1

Electronic Results Format: ESdat

Email for Results: Michael.Stacey@jacobs.com, Blair.Cumming@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other (

* Surcharges apply

Method of Shipment: ☐ Courier (☑ Hand Delivered ☐ Postal

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	BTEX	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A1 - GW1	20/06/16	Water										X	X	X									
2	A1 - GW2	↓	↓										X	X	X									
3	A1 - GW3	↓	↓										X	X	X									
4	A1 - QC07	↓	↓										X	X	X									
5	TS160614 - 15	↓	↓													X								
6	TB160614 - 15	20/06/16	Water													X								
7																								
8																								
9																								
10																								
11																								
12																								

Laboratory Use Only	Received By	Scott Carlon	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	21/06/16	Time	17:00	Signature		Temperature	0.1
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report №	505193

[illegible]

eurofins | mgt

Certificate of Analysis

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

NATA
WORLD RECOGNISED ACCREDITATION

Attention:	**Blair Cummings**
Report	**505193-W**
Project name	BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Received Date	Jun 21, 2016

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1 - GW1** **Water** **S16-Jn19461** **Jun 20, 2016**	**A1 - GW2** **Water** **S16-Jn19462** **Jun 20, 2016**	**A1 - GW3** **Water** **S16-Jn19463** **Jun 20, 2016**	**A1 - QC07** **Water** **S16-Jn19464** **Jun 20, 2016**
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	0.10	< 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	%	94	91	92	95
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 less Naphthalene (F2)^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.00001	mg/L	< 0.00001	0.00002	0.00001	< 0.00001
Perfluorooctanoic acid (PFOA)	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	< 0.00005
13C-PFHxA (surr.)	1	%	121	115	120	117
13C8-PFOS (surr.)	1	%	29	24	24	27
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	0.003	< 0.001
Cadmium (filtered)	0.0001	mg/L	0.0001	< 0.001	< 0.001	0.0001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	0.003	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001	0.0002	< 0.0001	< 0.0001

Client Sample ID			**A1 - GW1**	**A1 - GW2**	**A1 - GW3**	**A1 - QC07**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Jn19461**	**S16-Jn19462**	**S16-Jn19463**	**S16-Jn19464**
Date Sampled			**Jun 20, 2016**	**Jun 20, 2016**	**Jun 20, 2016**	**Jun 20, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Nickel (filtered)	0.001	mg/L	0.003	0.003	0.062	0.003
Zinc (filtered)	0.005	mg/L	0.008	0.013	0.057	0.008

Client Sample ID			**TS160614 - 15**	**TB160614 - 15**	**A1 - GW1**	**A1 - GW2**
Sample Matrix			**Water**	**Water**	**Water (Trace)**	**Water (Trace)**
Eurofins | mgt Sample No.			**S16-Jn19465**	**S16-Jn19466**	**S16-Jn19467**	**S16-Jn19468**
Date Sampled			**Jun 20, 2016**	**Jun 20, 2016**	**Jun 20, 2016**	**Jun 20, 2016**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.001	mg/L	104%	< 0.001	-	-
Toluene	0.001	mg/L	99%	< 0.001	-	-
Ethylbenzene	0.001	mg/L	96%	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	97%	< 0.002	-	-
o-Xylene	0.001	mg/L	99%	< 0.001	-	-
Xylenes - Total	0.003	mg/L	97%	< 0.003	-	-
4-Bromofluorobenzene (surr.)	1	%	103	92	-	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene^{N07}	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	-	-	< 0.00001	0.00010
Phenanthrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	-	-	< 0.00005	0.0001
2-Fluorobiphenyl (surr.)	1	%	-	-	106	96
p-Terphenyl-d14 (surr.)	1	%	-	-	123	114

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A1 - GW3** **Water (Trace)** **S16-Jn19469** **Jun 20, 2016**	**A1 - QC07** **Water (Trace)** **S16-Jn19470** **Jun 20, 2016**
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.00001	mg/L	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene^{N07}	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	< 0.00001	< 0.00001
Phenanthrene	0.00001	mg/L	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	< 0.00005	< 0.00005
2-Fluorobiphenyl (surr.)	1	%	97	83
p-Terphenyl-d14 (surr.)	1	%	114	94

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B6 (filtered metals)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 22, 2016	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jun 21, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 21, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 22, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8 filtered	Sydney	Jun 21, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 22, 2016	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
PFOS/PFOA/6:2FTS	Brisbane	Jun 21, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	Jun 21, 2016 6:00 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	505193	**Due:**	Jun 29, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Blair Cummings
Project Name:	BANKSTOWN AIRPORT - SITE 1				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Polycyclic Aromatic Hydrocarbons	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B6 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217						X	X		X
Brisbane Laboratory - NATA Site # 20794								X	
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	A1 - GW1	Jun 20, 2016		Water	S16-Jn19461			X	X
2	A1 - GW2	Jun 20, 2016		Water	S16-Jn19462			X	X
3	A1 - GW3	Jun 20, 2016		Water	S16-Jn19463			X	X
4	A1 - QC07	Jun 20, 2016		Water	S16-Jn19464			X	X
5	TS160614 - 15	Jun 20, 2016		Water	S16-Jn19465		X		
6	TB160614 - 15	Jun 20, 2016		Water	S16-Jn19466		X		
7	A1 - GW1	Jun 20, 2016		Water (Trace)	S16-Jn19467	X			
8	A1 - GW2	Jun 20, 2016		Water (Trace)	S16-Jn19468	X			
9	A1 - GW3	Jun 20, 2016		Water (Trace)	S16-Jn19469	X			
10	A1 - QC07	Jun 20, 2016		Water (Trace)	S16-Jn19470	X			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 505193
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 21, 2016 6:00 PM
Due: Jun 29, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail	Polycyclic Aromatic Hydrocarbons	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B6 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271				
Sydney Laboratory - NATA Site # 18217	X	X		X
Brisbane Laboratory - NATA Site # 20794			X	
External Laboratory				
Test Counts	4	2	4	4

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%

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/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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/L	< 0.00001			0.00001	Pass	
Perfluorooctanoic acid (PFOA)	mg/L	< 0.00001			0.00001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/L	< 0.00005			0.00005	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0001			0.0001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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 - 1999 NEPM Fractions							
TRH C6-C9	%	89			70-130	Pass	
TRH C10-C14	%	95			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
o-Xylene	%	98			70-130	Pass	
Xylenes - Total	%	97			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	94			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	96			70-130	Pass	
Acenaphthylene	%	79			70-130	Pass	
Anthracene	%	109			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	101			70-130	Pass	
Benzo(b&j)fluoranthene	%	116			70-130	Pass	
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	117			70-130	Pass	
Chrysene	%	117			70-130	Pass	
Dibenz(a.h)anthracene	%	99			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	119			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	118			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	101			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	85			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	84			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	88			70-130	Pass	
Cadmium (filtered)	%	90			70-130	Pass	
Chromium (filtered)	%	95			70-130	Pass	
Copper (filtered)	%	94			70-130	Pass	
Lead (filtered)	%	93			70-130	Pass	
Mercury (filtered)	%	92			70-130	Pass	

Test			**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Nickel (filtered)			%	91			70-130	Pass	
Zinc (filtered)			%	91			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S16-Jn19637	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Jn19637	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S16-Jn24981	NCP	%	116			70-130	Pass	
Cadmium (filtered)	S16-Jn24981	NCP	%	86			70-130	Pass	
Chromium (filtered)	S16-Jn24981	NCP	%	91			70-130	Pass	
Copper (filtered)	S16-Jn24981	NCP	%	76			70-130	Pass	
Lead (filtered)	S16-Jn24981	NCP	%	76			70-130	Pass	
Mercury (filtered)	S16-Jn24981	NCP	%	79			70-130	Pass	
Nickel (filtered)	S16-Jn24981	NCP	%	76			70-130	Pass	
Zinc (filtered)	S16-Jn24981	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Jn19463	CP	%	83			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-Jn19463	CP	%	97			70-130	Pass	
Toluene	S16-Jn19463	CP	%	97			70-130	Pass	
Ethylbenzene	S16-Jn19463	CP	%	97			70-130	Pass	
m&p-Xylenes	S16-Jn19463	CP	%	98			70-130	Pass	
o-Xylene	S16-Jn19463	CP	%	99			70-130	Pass	
Xylenes - Total	S16-Jn19463	CP	%	98			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Jn19463	CP	%	104			70-130	Pass	
TRH C6-C10	S16-Jn19463	CP	%	91			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Jn19642	NCP	%	88			70-130	Pass	
Acenaphthylene	S16-Jn19642	NCP	%	83			70-130	Pass	
Anthracene	S16-Jn19642	NCP	%	99			70-130	Pass	
Benz(a)anthracene	S16-Jn19642	NCP	%	109			70-130	Pass	
Benzo(a)pyrene	S16-Jn19642	NCP	%	122			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Jn19642	NCP	%	121			70-130	Pass	
Benzo(g.h.i)perylene	S16-Jn19642	NCP	%	96			70-130	Pass	
Benzo(k)fluoranthene	S16-Jn19642	NCP	%	116			70-130	Pass	
Chrysene	S16-Jn19642	NCP	%	108			70-130	Pass	
Dibenz(a.h)anthracene	S16-Jn19642	NCP	%	90			70-130	Pass	
Fluoranthene	S16-Jn19642	NCP	%	110			70-130	Pass	
Fluorene	S16-Jn19642	NCP	%	89			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn19642	NCP	%	94			70-130	Pass	
Naphthalene	S16-Jn19642	NCP	%	105			70-130	Pass	
Phenanthrene	S16-Jn19642	NCP	%	93			70-130	Pass	
Pyrene	S16-Jn19642	NCP	%	112			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S16-Jn19635	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S16-Jn19635	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S16-Jn19635	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Jn19635	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S16-Jn19635	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S16-Jn19635	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-Jn21311	NCP	mg/L	0.00002	0.00001	14	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-Jn21311	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-Jn21311	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S16-Jn24980	NCP	mg/L	0.001	0.001	5.0	30%	Pass	
Cadmium (filtered)	S16-Jn20149	NCP	mg/L	0.021	0.021	1.0	30%	Pass	
Chromium (filtered)	S16-Jn24980	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S16-Jn24980	NCP	mg/L	0.001	0.001	3.0	30%	Pass	
Lead (filtered)	S16-Jn20149	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S16-Jn20149	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S16-Jn24980	NCP	mg/L	0.002	0.002	2.0	30%	Pass	
Zinc (filtered)	S16-Jn24980	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-Jn19462	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Jn19462	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S16-Jn19462	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S16-Jn19462	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S16-Jn19462	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S16-Jn19462	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S16-Jn19462	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Jn19462	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S16-Jn19462	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Acenaphthylene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Anthracene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benz(a)anthracene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benzo(a)pyrene	S16-Jn19641	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Chrysene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Fluoranthene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Fluorene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Naphthalene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Phenanthrene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Pyrene	S16-Jn19641	NCP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Andrew Black	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Jonathon Angell	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

eurofins | mgt

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

Melbourne
3-5 Kingston Town Close
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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Jacobs Group (Australia) P/L NSW**
Contact name:	Blair Cummings
Project name:	BANKSTOWN AIRPORT - SITE 1
Project ID:	IA110700
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 21, 2016 6:00 PM
Eurofins | mgt reference:	**505193**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

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

Results will be delivered electronically via e.mail to Blair Cummings - Blair.Cummings@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1 21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600 E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company: Jacobs
Address: Level 4 100 Christie Street
St Leonards NSW 2065
Contact Name: Michael Stacey
Contact Phone №: 02 9032 1467
Special Direction:
Relinquished by (Signature): B. Cumming
(Time / Date): 17:10 21/06/16

Purchase Order: IA110700
Eurofins | mgt Quote №: 160413JACN
Project Manager: Blair Cumming
Project №: IA110700
Project Name: Bankstown Airport - Site 1
Electronic Results Format: ESdat
Email for Results: Michael.Stacey@jacobs.com, Blair.Cumming@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	BTEX			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A1 - GW1	20/06/16	Water										X	X	X												
2	A1 - GW2	↓	↓										X	X	X												
3	A1 - GW3	↓	↓										X	X	X												
4	A1 - QC07	↓	↓										X	X	X												
5	TS160614 - 15	↓	↓													X											
6	TB160614 - 15	20/06/16	Water													X											
7																											
8																											
9																											
10																											
11																											
12																											

Laboratory Use Only

Received By	Scott Carlon	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	21/06/16	Time	17:00	Signature		Temperature	0.1
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report №	505193

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

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	Blair Cummings
Report	506133-AID
Project Name	ADDITIONAL: BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Received Date	Jun 29, 2016
Date Reported	Jun 29, 2016

Methodology:

Asbestos ID	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. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz 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) Iron ores - Sampling and Sample preparation procedures is employed. 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 and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name	ADDITIONAL: BANKSTOWN AIRPORT - SITE 1
Project ID	IA110700
Date Sampled	May 24, 2016
Report	506133-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A1-TP11_ASB_0.4-WHITE	16-Jn26034	May 24, 2016	Approximate Sample 23g / 70x55x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.
A1-TP11_ASB_0.4-BROWN	16-Jn26035	May 24, 2016	Approximate Sample 25g / 70x60x5mm Sample consisted of: Grey compressed fibre cement material	Chrysotile asbestos detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 29, 2016	Indefinite

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.:
Report #: 506133
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 29, 2016 11:38 AM
Due: Jun 29, 2016
Priority: Same day
Contact Name: Blair Cummings

Project Name: ADDITIONAL: BANKSTOWN AIRPORT - SITE 1
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos Absence /Presence
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	A1-TP11_ASB_0.4-WHITE	May 24, 2016		Soil	S16-Jn26034	X
2	A1-TP11_ASB_0.4-BROWN	May 24, 2016		Soil	S16-Jn26035	X
Test Counts						2

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Authorised by:

Rhys Thomas	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

Sample Receipt Advice

Company name:	**Jacobs Group (Australia) P/L NSW**
Contact name:	Blair Cummings
Project name:	ADDITIONAL: BANKSTOWN AIRPORT - SITE 1
Project ID:	IA110700
COC number:	Not provided
Turn around time:	Same day
Date/Time received:	Jun 29, 2016 11:38 AM
Eurofins | mgt reference:	**506133**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Additional from 502324| Both bags indicated as ASB 0.4. We have labelled as per the colour.

Contact notes

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

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

Results will be delivered electronically via e.mail to Blair Cummings - Blair.Cummings@jacobs.com.

Sean 29/6 11:38
506133

From: Cummings, Blair [mailto:Blair.Cummings@jacobs.com]

Sent: Wednesday, 29 June 2016 11:38 AM

To: Andrew Black

Subject: RE: Asbestos Discrepancies

Hi Andrew,

That looks right, so A1-TP11_ASB_0.4 will need Asbestos ID analysis as well as an additional sample A1_TP11_ASB_0.3.

Regards,

Blair Cummings

Environmental Scientist | ANZ Infrastructure and Environment |

Jacobs

100 Christie Street St Leonards NSW 2065

T + 61 2 9032 1552 | F + 61 2 9928 2504 |

Blair.Cummings@jacobs.com | www.jacobsskm.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM1606429**	Page	: 1 of 6
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Contact	: Carol Walsh
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 02 9928 2100	Telephone	: +61-3-8549 9608
Project	: IA110700	Date Samples Received	: 02-Jun-2016 12:45
Order number	:	Date Analysis Commenced	: 03-Jun-2016
C-O-C number	: ----	Issue Date	: 08-Jun-2016 12:04
Sampler	: ----		
Site	: Bankstown Airport - Site 1		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED
ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**A1-QC02**	**A1-QC04**	**A1-QC06**	----	----
			Client sampling date / time	[30-May-2016]	[30-May-2016]	[30-May-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1606429-001**	**EM1606429-002**	**EM1606429-003**	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	**10.8**	**8.9**	**1.4**	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	**9**	<5	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	**13**	**32**	<2	----	----
Copper	7440-50-8	5	mg/kg	**11**	**22**	<5	----	----
Lead	7439-92-1	5	mg/kg	**29**	**56**	<5	----	----
Nickel	7440-02-0	2	mg/kg	**6**	**26**	<2	----	----
Zinc	7440-66-6	5	mg/kg	**20**	**48**	<5	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**A1-QC02**	**A1-QC04**	**A1-QC06**	----	----
			Client sampling date / time	[30-May-2016]	[30-May-2016]	[30-May-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1606429-001**	**EM1606429-002**	**EM1606429-003**	--------	--------
				Result	Result	Result	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	<50	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**93.3**	**96.1**	**105**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**93.2**	**95.6**	**104**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**66.4**	**80.1**	**82.2**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**98.8**	**95.2**	**110**	----	----
Anthracene-d10	1719-06-8	0.5	%	**107**	**109**	**117**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**101**	**111**	**114**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**103**	**96.3**	**101**	----	----
Toluene-D8	2037-26-5	0.2	%	**92.0**	**84.4**	**87.0**	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**A1-QC02**	**A1-QC04**	**A1-QC06**	**----**	**----**
			Client sampling date / time	[30-May-2016]	[30-May-2016]	[30-May-2016]	----	----
Compound	CAS Number	LOR	Unit	**EM1606429-001**	**EM1606429-002**	**EM1606429-003**	**--------**	**--------**
				Result	Result	Result	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	**104**	**95.4**	**99.3**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	*CAS Number*	*Recovery Limits (%)*	
		Low	***High***
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1606429**	Page	: 1 of 7
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Contact	: Carol Walsh
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 02 9928 2100	Telephone	: +61-3-8549 9608
Project	: IA110700	Date Samples Received	: 02-Jun-2016
Order number	:	Date Analysis Commenced	: 03-Jun-2016
C-O-C number	: ----	Issue Date	: 08-Jun-2016
Sampler	: ----		
Site	: Bankstown Airport - Site 1		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

WORLD RECOGNISED
ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 474442)									
EM1606424-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	22.2	21.2	4.83	0% - 20%
EM1606434-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	8.1	6.7	18.8	No Limit
EA055: Moisture Content (QC Lot: 474449)									
EM1606424-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	16.1	16.1	0.00	0% - 50%
EM1606426-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	6.6	9.8	38.5	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 474725)									
EM1606400-015	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	7	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	6	31.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	145	122	17.2	0% - 20%
EM1606400-024	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	11	13.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	32	26	20.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 474726)									
EM1606400-015	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1606400-024	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 474677)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 474677) - continued									
EM1606429-001	A1-QC02	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 474335)									
EM1606411-036	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1606437-005	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 474676)									
EM1606426-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1606429-001	A1-QC02	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 474335)									
EM1606411-036	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1606437-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 474676)									
EM1606426-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1606429-001	A1-QC02	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 474676) - continued									
EM1606429-001	A1-QC02	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 474335)									
EM1606411-036	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1606437-005	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike Concentration	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*		*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 474725)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	88.4	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.8	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	99.4	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.9	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	89	111
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	99.3	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 474726)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	92.4	85	103
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 474677)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	101	80	121
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	93.1	70	130
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	110	80	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	104	70	124
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	106	80	122
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	111	80	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	106	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	105	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	88.6	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	103	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	88.7	70	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	88.5	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	85.2	65	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	78.8	65	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	75.6	65	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	78.1	65	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474335)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	106	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474676)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	751 mg/kg	94.5	65	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3103 mg/kg	94.4	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1482 mg/kg	111	70	122
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474335)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	104	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474676)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1135 mg/kg	95.0	68	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4080 mg/kg	98.0	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	162 mg/kg	106	38	132
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN (QCLot: 474335)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	112	74	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	113	75	129
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	108	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	113	72	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	113	76	130
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	110	66	132

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 474725)							
EM1606400-016	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.9	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.8	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	91.2	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	90.7	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	82.8	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	86.4	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	# Not Determined	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 474726)							
EM1606400-016	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.2	76	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 474677)							
EM1606429-002	A1-QC04	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	102	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	142	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474335)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474335) - continued							
EM1606411-040	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	79.5	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474676)							
EM1606426-002	Anonymous	EP071: C10 - C14 Fraction	----	751 mg/kg	97.7	53	123
		EP071: C15 - C28 Fraction	----	3103 mg/kg	95.4	70	124
		EP071: C29 - C36 Fraction	----	1482 mg/kg	111	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474335)							
EM1606411-040	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	73.9	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474676)							
EM1606426-002	Anonymous	EP071: >C10 - C16 Fraction	----	1135 mg/kg	96.2	65	123
		EP071: >C16 - C34 Fraction	----	4080 mg/kg	98.7	67	121
		EP071: >C34 - C40 Fraction	----	162 mg/kg	116	44	126
EP080: BTEXN (QCLot: 474335)							
EM1606411-040	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	124	50	136
		EP080: Toluene	108-88-3	2 mg/kg	120	56	139

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1606429**	Page	: 1 of 4
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Telephone	: +61-3-8549 9608
Project	: IA110700	Date Samples Received	: 02-Jun-2016
Site	: Bankstown Airport - Site 1	Issue Date	: 08-Jun-2016
Sampler	: ----	No. of samples received	: 3
Order number	:	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1606400--016	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) A1-QC02, A1-QC04, A1-QC06	**30-May-2016**	**----**	----	----	**03-Jun-2016**	13-Jun-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) A1-QC02, A1-QC04, A1-QC06	**30-May-2016**	**06-Jun-2016**	26-Nov-2016	✓	**07-Jun-2016**	26-Nov-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) A1-QC02, A1-QC04, A1-QC06	**30-May-2016**	**06-Jun-2016**	27-Jun-2016	✓	**07-Jun-2016**	27-Jun-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) A1-QC02, A1-QC04, A1-QC06	**30-May-2016**	**06-Jun-2016**	13-Jun-2016	✓	**06-Jun-2016**	16-Jul-2016	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) A1-QC02, A1-QC04, A1-QC06	**30-May-2016**	**06-Jun-2016**	13-Jun-2016	✓	**06-Jun-2016**	16-Jul-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) A1-QC02, A1-QC04, A1-QC06	**30-May-2016**	**03-Jun-2016**	13-Jun-2016	✓	**03-Jun-2016**	13-Jun-2016	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	4	31	**12.90**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	**EM1606429**		
Client	**JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	Environmental Division Melbourne
Contact	BLAIR CUMMINGS	Contact	Carol Walsh
Address	100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	4 Westall Rd Springvale VIC Australia 3171
E-mail	blair.cummings@jacobs.com	E-mail	carol.walsh@alsglobal.com
Telephone	+61 02 9928 2100	Telephone	+61-3-8549 9608
Facsimile	+61 02 9928 2272	Facsimile	+61-3-8549 9601
Project	IA110700	Page	1 of 2
Order number		Quote number	EP2016SINKNI0001 (EP/2013/15 WABQ)
C-O-C number	----	QC Level	NEPM 2013 B3 & ALS QC Standard
Site	Bankstown Airport - Site 1		
Sampler			

Dates

Date Samples Received	02-Jun-2016 12:45 PM	Issue Date	02-Jun-2016
Client Requested Due Date	09-Jun-2016	Scheduled Reporting Date	**09-Jun-2016**

Delivery Details

Mode of Delivery	Carrier	Security Seal	Not Available
No. of coolers/boxes	1	Temperature	6.2°C - Ice present
Receipt Detail		No. of samples received / analysed	3 / 3

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA055-103 Moisture Content	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1606429-001	[30-May-2016]	A1-QC02	✓	✓
EM1606429-002	[30-May-2016]	A1-QC04	✓	✓
EM1606429-003	[30-May-2016]	A1-QC06	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	au-ap@jacobs.com
BLAIR CUMMINGS		
- *AU Certificate of Analysis - NATA (COA)	Email	blair.cummings@jacobs.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	blair.cummings@jacobs.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	blair.cummings@jacobs.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	blair.cummings@jacobs.com
- A4 - AU Tax Invoice (INV)	Email	blair.cummings@jacobs.com
- Chain of Custody (CoC) (COC)	Email	blair.cummings@jacobs.com
- EDI Format - ENMRG (ENMRG)	Email	blair.cummings@jacobs.com
- EDI Format - ESDAT (ESDAT)	Email	blair.cummings@jacobs.com
- EDI Format - XTab (XTAB)	Email	blair.cummings@jacobs.com
MICHAEL STACEY (JACOB)		
- *AU Certificate of Analysis - NATA (COA)	Email	michael.stacey@jacobs.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	michael.stacey@jacobs.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	michael.stacey@jacobs.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	michael.stacey@jacobs.com
- Chain of Custody (CoC) (COC)	Email	michael.stacey@jacobs.com
- EDI Format - ENMRG (ENMRG)	Email	michael.stacey@jacobs.com
- EDI Format - ESDAT (ESDAT)	Email	michael.stacey@jacobs.com
- EDI Format - XTab (XTAB)	Email	michael.stacey@jacobs.com

CHAIN OF CUSTODY RECORD

ABN 50005085521

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Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by (Signature)	B. Cumming
(Time / Date)	15 : 20 1 / 06 / 16

Purchase Order	IA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	IA110700
Project Name	Bankstown Airport - Site 1
Electronic Results Format	ESdat.
Email for Results	Michael.Stacey@jacobs.com, Blair.Cumming@jacobs.com
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY(Std) ☐ Other( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis

№	Client Sample ID	Date	Matrix	Soil: BTEX	Soil: Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Soil: Eurofins mgt Suite: B13 OCP/ PCB	Soil: Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Soil: Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	Soil: pH (CaCl2)	Soil: Cation Exchange Capacity (CEC)	Soil: % Clay content	Water: Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Water: Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Water: Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	① A1-QC02	30/05/16	Soil		X																	Please forward to ALS
2	A1-QC03	↓	↓		X																	
3	② A1-QC04	↓	↓		X																	Please forward to ALS
4	A1-QC05	↓	↓		X																	
5	③ A1-QC06	↓	↓		X																	Please forward to ALS
6	TS 160517-5	↓	↓	X																		
7	TB 160517-5	30/05/16	Soil	X																		
8																						
9																						
10																						
11																						
12																						

Environmental Division
Melbourne
Work Order Reference
EM1606429

Telephone : + 61-3-8549 9600

RS
CR
02/06/16

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	1/6/16	Time	—	Signature		Temperature
	Received By	Laura (AA)	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	/ /	Time	—	Signature		Report №

2/6, 12:45

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

Page 3 of 3

Document 5

Contamination Investigation

Site 2 (Drover Road)

Bankstown Airport

Bankstown Airport Limited

3 | FINAL

28 September 2016

Contamination Investigation - Site 2 (Drover Road), Bankstown Airport

Project no:	IA110700
Document title:	Contamination Investigation –Site 2 (Drover Road), Bankstown Airport
Document No.:	1
Revision:	3
Date:	28 September 2016
Client name:	Bankstown Airport Limited
Client no:	
Project manager:	Blair Cummings
Author:	Blair Cummings/Michael Stacey
File name:	J:\IE\Projects\04_Eastern\IA110700\21 Deliverables\Site 2\IA110700_Bankstown Airport Contamination Investigation Site 2 - Rev3.docx

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Document history and status

Revision	Date	Description	By	Review	Approved
V1	07/07/16	Technical Review	BC	MS	MS
DRAFT	08/07/16	Client Review	BC	BH	MS
Rev2	19/08/16	Client Comments	MS	MS	MS
Rev 3	28/09/16	AEO Review	MS	MS	MS

Contents

1 Introduction

Jacobs Group (Australia) Pty Ltd (Jacobs) was commissioned by Bankstown Airport Limited (BAL) to undertake a contamination investigation of the proposed development site known as Site 2, Drover Road (referred to hereinafter as the site) located on a portion of airside land at Bankstown Airport, NSW. Based on information provided by BAL, the footprint of development at the site will occupy an area of approximately 35,000 m^2.

The location of the site is presented as **Figure 1-2**.

This report details the works undertaken during the contamination investigation undertaken at the site, field observations and the sampling results and analysis with an assessment against the limits listed in *Airports (Environment Protection) Regulations 1997* (the Airport Regulations)*, Table 1 – areas of an airport generally* and those guidelines endorsed by the NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999* as revised in 2013 (NEPM 2013).

The investigation was undertaken in general accordance with the Jacobs *Proposal for Contamination and Geotechnical Investigations – Proposed Sites 1, 2 and 3, Bankstown Airport* dated 15 March 2016 and subsequent email for additional sampling dated 16 May 2016 and 9 August 2016.

This report has been generally prepared in general accordance with the requirements specified for a Detailed Site Investigation as detailed in the NSW EPA (1997) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.*

2 Objectives and Scope of Works

The objectives of the contamination investigation were as follows.

- Identify the nature and extent of any pre-existing potential contamination at the site that may be encountered during development
- Identify the nature and extent of potential contamination at the site that would deem the suite unsuitable for the proposed continued airport land use (i.e. commercial/industrial land use).

The scope of works undertaken to address the objectives are detailed below. Sampling locations are presented on **Figure 2-2**.

2.1 Soil Contamination Investigation

- Undertook preliminary investigations including a detailed site inspection, review of available historical aerial photographs (held by Jacobs and BAL) and interviews with BAL staff with site knowledge.
- Service locating for services by a qualified service locator and Dial Before You Dig Search.
- Excavation of 35 test pit locations (A2-TP01 to A2-TP35) across the site with aid of a backhoe. All test pits were excavated to 1.0 m below ground level (bgl), intersection with the water table or excavation method refusal (whichever was shallower). 20 test pit locations (A2-TP01, A2-TP02, A2-TP03, A2-TP04, A2-TP06, A2-TP08, A2-TP09, A2-TP10, A2-TP11, A2-TP14, A2-TP15, A2-TP16, A2-TP17, A2-TP20, A2-TP21, A2-TP22, A2-TP23, A2-TP24, A2-TP26, A2-TP28) were excavated to 2.5 m bgl, to assess the depth to groundwater (if observed) and were additionally used for the asbestos investigation (refer below)
- Drilling of 10 borehole locations (A2-BH01 to A2-BH10) across the site with the aid of a tracked drilling rig. All boreholes were drilled to 10 m bgl or excavation method refusal (whichever was shallower)
- The 35 test pit and 10 borehole locations completed as part of the contamination investigation meet the minimum sampling points required for site characterisation outlined in the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines* for a site with an area of 35,000 m^2
- Soil samples were collected from the test pits and boreholes with selected samples (primary and QC samples) submitted to a National Association of Testing Authorities (NATA) accredited laboratory for analysis/identification for a range of common contaminant compounds including Perfluorinated Chemicals (PFCs).

2.2 Asbestos Investigation

With the absence of assessment criteria for asbestos in soils in the Airport Regulations, an asbestos assessment was undertaken in accordance with the Western Australia Department of Health (May 2009) *Guidelines for the Assessment and Management of Asbestos-Contaminated Sites in Western Australia* (WADOH 2009). In accordance with *Table 1 – Triggers and Types of Asbestos Investigations* from the WADOH (2009) guidelines, Jacobs assumed that there was a possible likelihood of asbestos being present on the site and that the asbestos (if present) could be in any form. Based on the possible likelihood, the investigation regime comprised an assessment from 22 test pit locations excavated as part of the contamination investigation. The scope of works for the asbestos investigation is detailed below:

- Excavation of 22 test pit locations (A2-TP02, A2-TP04, A2-TP06, A2-TP07, A2-TP08, A2-TP10, A2-TP11, A2-TP12, A2-TP13, A2-TP15, A2-TP17, A2-TP18, A2-TP20, A2-TP21, A2-TP22, A2-TP23, A2-TP24, A2-TP26, A2-TP29, A2-TP33, A2-TP34, A2-TP35) across the site with aid of a backhoe. All test pits were excavated to a depth 2.5 m bgl

- Select material excavated from the test pits was inspected for potential asbestos containing materials (ACM)

- Soil samples were collected from the test pits with selected samples submitted to a NATA accredited laboratory for ACM, fibrous asbestos (FA) and asbestos fines (AF) identification.

Based on the initial laboratory results, four additional bulk samples were collected from surface soils surrounding test pit location A2-TP17 and submitted to a NATA accredited laboratory for ACM, FA and AF identification.

2.3 Groundwater Investigation

- Drilling of three boreholes (A2-GW1 to A2-GW3) at anticipated hydraulic up gradient and down gradient positions with the aid of a tracked drill rig and installation of groundwater monitoring wells. All boreholes for groundwater well installation were drilled to a maximum depth of 8 m bgl, 1 m below the observed static water level or excavation method refusal (whichever was shallower)

- Groundwater samples were collected from the wells with samples (primary and QC samples) submitted to a NATA accredited laboratory for analysis for a range of common contaminant compounds including PFCs

- Groundwater well location heights were surveyed to site datum.

2.4 Reporting

Preparation of a report detailing the results of the contamination investigation and laboratory analysis. The report includes an assessment as to the suitability of the site for continued airport land use and an assessment as to the potential impacts to development of the site (with respect to contamination).

3 Data Quality Objectives

Data Quality Objectives (DQO) are an important component of any sampling and analysis programme as they outline the aims and objectives of the investigation program with respect to the integrity of the data collection and interpretation. In order to address the DQO and to ensure that they have been achieved the following seven-step process was undertaken. The DQO process has been adopted from the Australian Standard (AS 4482.1-2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.*

Step 1 - State the Problem

The problem was potential contamination attributable to historical site usage above the NSW EPA endorsed guidelines for commercial/industrial land use, airport regulations and protection of beneficial groundwater users and receiving environments.

Step 2 - Identify the Decision Statement

The primary decision statement that the contamination investigation will attempt to resolve is:

> "Does contamination at the site pose an unacceptable risk to human or environmental health which may prevent the development and operation of the site for continued airport use"?

Step 3 - Identify inputs to the decision

The following informational inputs were required to resolve the decision statement:

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as revised 2013) - *Schedule B1 Guideline on Investigation levels for Soil and Groundwater* (NEPC, 2013)
- Airports (Environment Protection) Regulations 1997 (the Airport Regulations)
- Western Australia Department of Health (May 2009) *Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA Guidelines)*
- GHD (June 2015) *Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework*
- National Health and Medical Research Council (2008) *Guidelines for Managing Risks in Recreational Waters* (NHMRC, 2008)
- enHealth (June 2016) *Guidance Statements on Pefluorinated Chemicals – Interim Values* (enHealth, 2016).

Step 4 - Define the Boundaries of the Study

The investigation extended laterally across accessible areas of the site for coverage and to target areas of environmental interest. All locations were extended vertically to the limit of the investigation or excavation method refusal.

Step 5 - Develop a Decision Rule

The purpose of this step was to define the parameter of interest, specify the action level and combine the outputs of the previous DQO steps into an "if…then…" decision rule that defines the conditions that would cause the decision maker to choose alternative actions.

The parameters of interest (or Contaminants of Concern) have been determined based on background information and to establish baseline chemical conditions and contaminant concentrations. The action level (Site Assessment Criteria) will be used to decide if the parameter represents a potentially unacceptable risk for commercial/industrial land use, human health and/or the environment. If the measured concentration of a compound exceeds the action levels in soils, water and vapour, then this is deemed to present a potential unacceptable risk considering the current land use, adjoining land use and environmental receptors. This also indicates that refinement of the Site Assessment Criteria (SAC) by undertaking Detailed Risk Assessment (DRA) is warranted. Should this DRA action value be exceeded, remediation will be required. In some instances (such as presence of free phase hydrocarbons), the development of the DRA can be by-passed and intervention through remediation applied directly.

Step 6 - Specify Acceptable Limits on Decision Errors

There were decided to be two types of errors:

a) Deciding that the site is acceptable for continued airport use (i.e. no risk to site users and/or receptors) when it actually is not acceptable. The consequence of this error may be unacceptable health risk for site users, adjoining site users and receiving environments; or

b) Deciding that the site is unacceptable for continued airport use (i.e. risk to site users and/or receptors) when it actually is acceptable. The consequence of this error is that the client will pay for further investigation / remediation that are not necessary.

The more severe consequences are with decision error (a) since the risk of jeopardising human health and/or the environment outweighs the consequences of paying more for remediation. It will not be possible to conduct statistical hypothesis tests as the proposed sampling programme as part of this contamination investigation consists of the collection of one round of samples only.

Step 7 - Optimising the Design for Obtaining Data

The purpose of this step was to identify a resource-effective data collection design for generating data that are expected to satisfy the DQO.

The resource effective data collection design that was expected to satisfy the DQO is described in detail in **Sections 10** of this report. To ensure the design satisfies the DQO a comprehensive Quality Assurance and Quality Control Plan was implemented as described in **Section 11** of this report.

4 Site Information

The site information presented below is based on a review of readily available government information sources and information provided by BAL.

4.1 Site Identification

Based on information from NSW Department of Finance and Services, Land and Property Information Spatial Information Exchange (SIX), the site is located within the local government area (LGA) of Canterbury-Bankstown and comprises the following lots (whole or a portion of):

- Lot 307, deposited plan (DP) 10774400
- Lot 308, DP 10774400
- Lot 102, DP 852861
- Lot 671, DP 1014122
- Lot 41, DP 1170088.

4.2 Site Zoning and Land Use

The current zoning of the site is SP2 – Air Transport Facility under the Bankstown Local Environment Plan (LEP) 2015. At the time of preparing this report, the site was being used as an airport.

4.3 Geology

Review of the 1:100,000 Penrith Geological Sheet 9030 (Edition 1, 1991) indicated the site is within an area underlain by fluvial sediments. The sediments overlie Ashfield Shale of the Wianamatta Group. The fluvial sediments comprise clayey quartzose sand and clay. The Ashfield Shale comprises dark-grey to black claystone-siltstone and fine sandstone-siltstone laminite.

4.4 Soils

Review of the 1:100,000 Penrith Soil Landscape Series Sheet 9030 (1989) indicated that the area in which the site is located has been disturbed by human activity to a depth of at least 100 cm. The original soil has been removed, greatly disturbed or buried. Most of these areas have been levelled to slopes of less than 5%. Landfill includes soil, rock, building and waste materials. The original vegetation has been completely cleared.

The natural soils underlying these disturbed areas consist of fluvial sediments of the Berkshire group of soils. The Berkshire group of fluvial sediments are typically characterised by orange heavy clays and clayey sands, often mottled and with ironstone inclusions. Due to the depositional action of the fluvial sediments, they can exhibit marked differences in soil texture, colour, stoniness and calcium carbonate content.

4.5 Hydrogeology

Groundwater within the catchment occupied by the site is expected to flow to the west and south-west towards the Georges River. Shallow groundwater beneath the site is expected to be perched above the residual weathered bedrock and to be recharged predominantly by the infiltration of surface water falling onto the unsealed surfaces of the site.

Surface water flowing across sealed taxiways and runways would be directed towards the drainage channels located to the north and west of the site.

The Georges River is located approximately one kilometre to the west of the site.

4.6 Acid Sulfate Soils

Areas of the site are defined in the Liverpool Acid Sulfate Soil Risk Map (Edition 2, 1997) as disturbed terrain with an elevation of 2 m to greater than 4 m AHD. Disturbed terrain is defined as filled areas, which often occur during reclamation of low-lying wetlands and floodplains for urban development. Other disturbed terrain includes areas which have been mined or dredged, or have undergone heavy ground disturbance through general urban development or construction of dams or levees.

No suspected ASS were observed in the material excavated during the contamination investigation because fill and natural soil did not exhibit the following characteristics (as defined in the ASSMAC 1998):

- Fill and soils did not exhibit a sulphurous smell
- There was no evidence of shell
- No jarositic horizons or substantial iron oxide mottling was observed; or
- Fill and soils were not classified as unripe muds (soft, buttery, blue grey or dark greenish grey) or estuarine silty sands or sands (mid to dark grey) or bottom sediments of estuaries or tidal lakes (dark grey to black).

The Bankstown Local Environment Plan (LEP) 2015 ASS map sheet defines the areas below the site as Class 3.

5 Site History

The site history has been based on a review of the report prepared by Godden Mackay Logan (April 2005) *Bankstown Airport, Heritage Management Strategy*. The Godden Mackay Logan (April 2005) report outlines the history of the entire Bankstown Airport site. It should be noted that the historical operations/activities detailed may not have been specifically undertaken on the site (i.e. Site 2). A brief outline of the site history is provided below.

- The Bankstown Airport site was formerly occupied by market gardens, poultry farms and commercial premises (including a service station) located at the corner of Milperra and Billiana Roads
- Construction of the Bankstown Aerodrome commenced in 1940
- The Royal Australian Air Force (RAAF) established at the site in late 1940. The activities undertaken by the RAAF included airfield and training operations, aircraft assembly and temporary accommodation for RAAF personnel
- The Women's Australian Auxiliary Air Force (WAAAF) established to the site in 1941. The activities undertaken by the WAAAF included training, administration and accommodation
- The US Air Force were accommodated at the site from 1942 to 1945. The site was used as a base for a number of squadrons and accommodated the associated personnel
- The Clyde Engineering Co Pty Ltd undertook maintenance, repair and modification of aircraft from 1942
- Hawker de Havilland opened a factory in 1942 for the manufacture of aircraft and parts
- A Mobile Naval Air Base was commissioned at Bankstown in 1945. As part of this commission, hangers, taxiways and associated facilities were constructed
- From 1945 to 1950 sections of the site were used to house migrants
- The control of the Bankstown Airport was divested to the Department of Civil Aviation in 1980.

6 Preliminary Investigation

Jacobs undertook a preliminary investigation of the site to assess whether historical land use and/or activities undertaken on and/or adjacent to the site could have contaminated the site. The preliminary investigation also included an assessment of the potential for PFCs contamination in general accordance with the Department of Infrastructure and Regional Development GEM-002 *PFC – management actions advice.*

The results of the preliminary investigation were used to refine the intrusive investigation plan so as to target potential areas of interest and contaminants of concern (where identified). The results of the preliminary investigation are detailed below.

6.1 Aerial Photograph Review

Aerial photographs held by Jacobs and BAL were examined to provide a visual indication of the potential historical activities and changes which have taken place at or within areas adjoining the subject site. Historical aerial photos held by Jacobs were examined for the years 1943, 1986, 1991, 2000, 2005, 2007, 2009, 2011 and 2015, while historical aerial photos held by BAL were examined for the years 1950, 1956, 1957, 1961, 1967, 1977, 1979, 1980, 1985, 1986 and 2000. From a review of the historical aerial photos the subject site and it's surrounds appeared vacant except for some shelter and accommodation type buildings observed in aerial photos from 1943 adjacent and directly to the north east of the site. A few small planes were observed to be parked directly north of the site in aerial photos from 1961 along with a small round helipad or windsock type concrete pad. Formalised runways also appeared to the south and south east of the site. From 1977 onwards areas directly to the north east of the site appear to have been used as an area to park small aircraft. A portion of the plane parking area directly to the north east of the site was observed to be a concrete pad in an aerial photo from 1986. A wind sock and associated instrumentation appear in the south eastern corner of the site from 1991 onwards. One large and one medium rectangular storage type containers appear in the north eastern portion of the site and three large hanger type structures appear directly to the north and north east of the site in an aerial photo from 2000. Small aircraft appear on the concrete aprons adjacent of the three large rectangular hangers directly north and north east of the site periodically in aerial photos from 2000 onwards. A helipad appears on vacant land directly to the north west of the site in an aerial photo from 2005, the north east portion of the site adjacent and directly south of a large rectangular hanger appears to have been periodically used to park small planes and a truck in aerial photos from 2007 onwards.

6.2 Interviews

An interview was conducted with Mr Craig Smith, Facilities Management Coordinator at BAL on the 11 May 2016 prior to conducting a site inspection and walkover to gain an understanding of any potentially contaminating events or activities that may have occurred on the site in the past. Of particular interest were any fires, crashes, spills or structures that may have caused potential contamination (including PFC contamination). Anecdotal information from Mr Smith indicated that he had worked at the airport for approximately 20 years and had spoken to a few employees who had been there for a similar period of time. Mr Smith provided the following anecdotal information regarding past activities on and around the site that may have contributed to potential contamination of the site:

- A firefighting exercise had been conducted on the north western portion of the site within the past five years. The exercise consisted of lighting a drum on fire and having emergency services put it out with a mixture of water and foam. The exercise was identified as an activity that could have resulted in PFC contamination of surface soils and of groundwater beneath the site. This triggered the requirement for PFC analysis of groundwater and soil samples collected from across the site.

- The northern portion of the site was identified as having being raised and levelled with fill material consisting predominately of silty clay.

6.3 Site Inspection

A site inspection and walkover was conducted on 11 May 2016. During the course of the site inspection and walkover, no obvious signs of ACM, fuel or chemical spills, evidence of fires, crashes or staining of soils were observed across the surface of the site. A raised and levelled area of fill material was observed across the northern portion of the site and consisted of a silty clay material with gravel and fragments of sandstone and crushed rock (consistent with anecdotal information).

7 Site Description

At the time of the investigation, the site was located airside and comprised a vacant grassed area, taxiway, open drain and access road. The grassed area also contained a wind sock and associated instrumentation. The surrounding area consisted of taxi zones for aircraft which led to the main runway and a helipad and large sheds, which were likely used as hangars/workshops for small aircraft.

Operations that were undertaken at the site during the time of the investigation included:

- Aircraft activity: this involved aircraft leaving the hangar adjacent and directly north of the site and travelling along the taxi zone towards the main runway
- Helicopter activity within the helipad area adjacent to the site
- Airport vehicles travelling along the runway/taxi zone and access road
- Possible refuelling activities within the hanger area adjacent to site.

8 Fieldwork – Soil Investigation

Jacobs undertook the contamination investigation works at the site between 16 May 2016 and 1 June 2016. The site investigation and sampling was undertaken in accordance with documented Jacobs procedures by an experienced Jacobs environmental scientist.

8.1 Sampling Pattern

Sample locations were positioned across the proposed footprint of the development (based on information provided by BAL) as follows:

- To undertake sufficient sample locations to meet the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines Table A: Minimum Sampling Points Required for Site Characterisation Based on Detecting Circular Hot Spots by Using Systematic Sampling Pattern.* The 35 test pit and 10 borehole locations (45 sample locations in total) meet the minimum sampling points required for site characterisation for a site with an area of 35,000 m^2 as outlined in the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines*

- To undertake sufficient sample locations to meet WADOH (2009) *Table 1 – Triggers and Types of Asbestos Investigations.* Based on the possible likelihood, the investigation regime comprised an asbestos assessment from 22 test pit locations (i.e. half of the overall sample locations) excavated as part of the contamination investigation

- To target areas of potential concern as identified during the preliminary investigation

- To assess groundwater quality migrating onto and from the site.

Sampling locations and the proposed development footprint are presented in **Figure 2-2**.

8.2 Depth Intervals of Sampling

8.2.1 Soil Contamination Investigation

For the soil contamination investigation, soil samples were collected as follows:

- As grab samples from the surface of the site and directly from the centre of the excavator bucket at depths of approximately 0.5 m and at 1.0 m intervals or at other discrete locations where there was evidence of potential contamination (odorous or discoloured soils, erroneous waste or fill)

- As grab samples from the surface and from a decontaminated SPT sampler during the drilling of boreholes at approximately 0.5 m and 1.5 m bgl.

8.2.2 Asbestos Investigation

For the asbestos investigation, sampling intervals were as follows:

- 10 litres of representative material excavated from test pits was collected from both 0.0 – 1.0 m and 1.0 – 2.0 m depth ranges where fill material was observed. The 10 litre samples were spread out on black plastic sheeting, raked and inspected for potential ACM

- Where potential ACM was identified within the 10 litre samples, all observable potential ACM was collected and weighed
- Where no potential ACM was identified in the 10 litre samples, a 500 ml sample was collected from material within the top 300 mm of the test pit.

To further assess AF concentrations detected in surface soils at test pit location A2-TP17, four additional 500 ml samples were manually excavated and collected from material within the top 100 mm of the excavations. Additional sample locations were excavated approximately 2m from and to the north, south, east and west of location A2-TP17.

8.3 Method of Sample Collection

8.3.1 Soil Contamination Investigation

All soil samples at depth were collected directly from the excavator bucket, as grab samples from surface soils or as undisturbed samples from a decontaminated SPT sampler. Samples were transferred to sample containers by Jacobs field staff by hand using disposable nitrile gloves.

Care was taken to ensure that representative samples were obtained from the depth required and that the integrity was maintained, particularly when dealing with potentially volatile and semi-volatile components.

8.3.2 Asbestos Investigation

No potential ACM was observed in the 22 test pits excavated for the asbestos investigation. A total of 22 bulk samples were collected as grab samples from material representing the top 300 mm of soil observed at the respective test pit locations.

An additional four bulk samples were collected as grab samples from material representing the top 100 mm of soil observed at the manual excavation locations surrounding test pit location A2-TP17.

8.4 Sample Containers, Method of Sample Storage and Handling

All soil samples for the soil investigation were placed in jars provided by the primary laboratory Eurofins MGT (Eurofins). All sample jars were fitted with Teflon lined lids. Zip lock bags were used to contain the bulk samples collected as part of the asbestos investigation. The jars and zip lock bags were completely filled with soil, labelled with the date, unique sampling point identification and sampler information.

The soil jars and zip lock bags once filled with sample and sealed, were immediately placed in an esky/cool box in which a cooling medium had been added to keep the samples below a temperature of approximately 4 ^{o}C. At the end of the sampling program the samples in the cool box were transported to the laboratory. Custody seals were placed on the esky / cool box for delivery to the laboratory.

8.5 Decontamination Procedures

Samples from test pits and surface samples were collected as grab samples from material at the centre of the excavator bucket or directly from the surface of the site using new disposable nitrile gloves, changed between sample locations.

Samples from boreholes were collected from a decontaminated SPT sampler using new disposable nitrile gloves, changed between sample locations. The SPT sampler was decontaminated between sample locations by washing in potable water and then rinsed in potable water.

8.6 Sample Logging and Documentation

Experienced Jacobs field staff completed soil logs during the field investigation. The logs recorded the following data:

- Sample number and depth
- Soil classification, colour, consistency or density, moisture content and obvious indications of contamination
- Depth of excavation
- Excavation refusal
- Method of excavation.

In addition, the physical attributes of samples such as soil/fill characteristics, obvious signs of contamination such as discolouration and/or odour were noted on the logs.

All samples, including QA samples, were transported to the primary laboratory under Chain-of-Custody (CoC) procedures and maintained in an ice-filled cool box. The CoC detailed the following information:

- Site identification
- The sampler
- Nature of the sample
- Collection time and date
- Analyses to be performed
- Sample preservation method.

8.7 Laboratory Analysis

Soil samples were selected for analysis based generally on providing vertical and lateral coverage of the site and on visual observations.

8.7.1 Soil Contamination Investigation

Soil samples were analysed for the following potential contaminants of concern:

- 48 samples (40 primary + 8 QA/QC) for heavy metals, Total Recoverable Hydrocarbons (TRH), monocyclic aromatic hydrocarbons (BTEX), polycyclic aromatic hydrocarbons (PAH)

- 21 samples for heavy metals, TRH, BTEX, PAH, organochlorine pesticides (OCP) and polychlorinated biphenyls (PCB)
- 21 samples for perfluorinated compounds (PFOS, PFOA and 6:2 FTS)
- One sample for pH, cation exchange capacity (CEC) and % clay
- Two trip spike/trip blank for BTEX.

8.7.2 Asbestos Investigation

Bulk soil/fill samples from the surface soils (0-300 mm) were analysed for ACM, AF and FA.

8.8 Analytical Parameters and Methods

Jacobs commissioned Eurofins MGT (Eurofins) as the primary laboratory and Australian Laboratory Services (ALS) as the secondary laboratory. Envirolab Services (Envirolab) were commissioned to undertake the additional asbestos fines analysis. Eurofins, ALS and Envirolab are NATA accredited for the testing undertaken.

Where appropriate, the soil samples were analysed in accordance with NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013* (NEPC, 2013) guidelines using methods based on US Environment Protection Agency (US EPA) and American Public Health Association (APHA) approved analytical methods.

Asbestos identification was undertaken in accordance with the analytical methods detailed in the WADOH (2009) guidelines.

9 Fieldwork - Groundwater Investigation

Three groundwater wells (A2-GW1, A2-GW2 and A2-GW3) were installed to assess groundwater quality beneath and migrating onto the site and to identify any potential impacts to environmental receptors and beneficial groundwater users from the migration of contaminated groundwater (if present) onto and from the site. The groundwater investigation comprised:

- Construction of groundwater wells using new, Class 18, 50 mm UPVC with machine slotted screen sections, gravel pack, bentonite seal and grout/bentonite to the surface. The wells were completed flush with the ground level with a gatic cover
- Survey of the groundwater wells to site datum to allow for the calculation of groundwater flow gradients
- Measuring of water levels within all wells to assess depth to groundwater
- Development, purging and sampling of all newly installed groundwater wells.

Sampling locations and the proposed development footprint are presented in **Figure 2-2**.

9.1 Well Development and Sample Collection

Fieldwork was undertaken in accordance with documented Jacobs procedures by experienced staff. Groundwater wells were developed using a submersible pump.

Following development, the wells were allowed to stabilise for a minimum of 48 hours before being purged and sampled. The monitoring wells were purged prior to sampling in order to remove standing or stagnant water in the well and to ensure that samples collected were representative of the groundwater within the aquifer.

Monitoring wells were purged and sampled using a peristaltic pump. The pump had flow control to minimise drawdown and new dedicated, disposable polyethylene and silicon tubing was used for the collection of each sample. Care was taken to minimise the potential for volatile losses during sampling.

The electrodes of a calibrated water quality meter were used to measure pH, redox potential (Eh), electrical conductivity, dissolved oxygen and temperature in water purged from the wells. Samples were collected following stabilisation of these water quality parameters (generally ± 10%). A calibration certificate for the water quality meter is presented in **Appendix D**.

9.2 Decontamination Procedures

The submersible pump was decontaminated between groundwater well locations by washing in potable water and then rinsed in potable water.

Dedicated, single use sample tubing was used to purge and to sample all wells. All samples were collected using new disposable nitrile gloves, changed between sample locations.

9.3 Sample Containers

Laboratory supplied sample containers were used to contain the groundwater samples. Sample containers were filled in order of volatility, with samples for the most volatile substances collected first.

9.4 Method of Sample Collection, Storage and Handling

All sample containers were labelled with the sample number, project number, date obtained and sampler and site name. This information was repeated on the CoC form.

Sample containers were filled in order of the most volatile substances. Care was taken to minimise disturbance of the sample to avoid aeration by minimising the distance between the outlet tubing and the container and tilting the container so that discharge flowed gently down the inner walls. Samples for dissolved heavy metals in groundwater were field filtered using 0.45 micron single use stericups.

Once filled, the caps were checked to ensure that they were secure (and that there were no air bubbles/head space within the glass vials and bottles) then placed within an esky / cool box in which a cooling medium had been added to keep the samples below a temperature of approximately 4 ^{o}C. Custody seals were placed on the esky / cool box for delivery to the laboratory.

9.5 Sample Logging and Documentation

While on site, the Jacobs field staff completed sampling field data sheets which document (where applicable):

- Time of sample collection
- Weather
- Unique sample identification number
- Sample location and depth
- Static Water Level
- Water quality screening results (DO, Temperature, Redox potential, pH and conductivity)
- Presence or absence of odour (nature and intensity)
- Colour of the water
- Presence or absence of sediment in the well
- Well condition and purging volumes.

All samples, including QA samples, were transported to the primary laboratory under CoC procedures and maintained in an ice-filled cooler. The CoC detailed the following information:

- Site identification
- The sampler
- Nature of the sample
- Collection date of the sample
- Analyses to be performed

- Sample preservation method.

9.6 Laboratory Analysis – Water

Four (three primary and one QA/QC samples) groundwater samples were collected and analysed for dissolved heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), TRH, BTEX, PAH, PFOS, PFOA and 6:2 FTS.

9.7 Analytical Parameters and Methods

Jacobs commissioned Eurofins as the primary laboratory. Eurofins are NATA accredited for the analysis undertaken.

Where appropriate, the groundwater samples were analysed in accordance with NEPC (2013) using methods based on US EPA and APHA approved analytical methods.

10 Quality Control Plan

Field and laboratory QA/QC requirements compliant with NEPC (2013) requirements (where applicable) were undertaken as part of the field work program as outlined below.

10.1 Field QA/QC Programme

Field QA/QC for this project consisted of the collection of blind replicate, split replicate, trip blank and trip spike samples.

10.1.1 Environmental Samples

Environmental samples or field samples were the representative soil and groundwater samples collected for analysis to determine aspects of their chemical composition.

10.1.2 Blind Replicate Samples

Blind replicate samples were provided by the collection of two environmental samples from the same location. These samples were preserved, stored, transported, prepared and analysed in an identical manner. As a minimum, the results of analyses on the blind replicate sample pair were assessed by calculating the Relative Percentage Differences (RPDs) between the results. The RPD was calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeded the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Blind replicate samples were generally collected at a rate of one duplicate for every 20 environmental samples in accordance with AS 4482.1-2005.

10.1.3 Split Samples

Split samples provided a check on the analytical proficiency of the laboratories. Split samples were provided by the collection of two environmental samples from the same location. These samples were preserved, stored and transported in an identical manner. The spilt samples were analysed by the secondary laboratory. As a minimum, the results of analyses on the split replicate sample pair were assessed by calculating the RPDs between the results. The RPD was calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeded the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Split replicate samples were generally collected at a rate of one duplicate for every 20 environmental samples in accordance with AS 4482.1-2005.

10.1.4 Trip Blanks

The trip blanks consisted of laboratory-supplied purge water and clean sand. The purpose of trip blanks was to detect potential contamination during sample transport. These samples were kept within eskies during sampling activities and were not opened in the field. Trip blanks were analysed at the laboratory as regular samples for BTEX compounds only.

Trip blanks were submitted with every batch of soil and water samples delivered to the respective primary laboratories.

10.1.5 Laboratory-Prepared Trip Spike

Laboratory-prepared trip spikes consisted of purge water or sand spiked with known concentrations of BTEX. These samples were submitted for BTEX analysis with the results compared with the known additions. Generally, samples were spiked with concentrations of 15, 15, 15 and 30 ppm of benzene, toluene, ethylbenzene and total xylenes respectively. The purpose of these samples was to monitor VOC losses during transit.

Trip spikes were submitted with every batch of soil and water samples delivered to the respective primary laboratories.

10.2 Laboratory QA/QC Programme

The reliability of test results from the analytical laboratories was monitored according to the QA/QC procedures used by the NATA accredited laboratory. The QA/QC programme employed by Eurofins (the primary laboratory) specified holding times, extraction dates, method descriptions, Chain of Custody (COC) requirements, analysis, LORs and acceptance criteria for the results. Laboratory QA/QC requirements undertaken by Eurofins and ALS are based on NEPM requirements and are outlined below (NEPC, 2013).

10.2.1 Laboratory Duplicate Samples

Laboratory duplicates provided data on analytical precision for each batch of samples.

Laboratory duplicates were performed at a rate of one duplicate for batches of 8-10 samples with an additional duplicate for each subsequent ten samples.

10.2.2 Laboratory Control Samples

Laboratory control samples consisted of a clean matrix (de-ionised water or clean sand) spiked with a known concentration of the analyte being measured. These samples monitored method recovery in clean samples and were used (where required) to evaluate matrix interference by comparison with matrix spikes.

10.2.3 Surrogates

For organic analyses, a surrogate was added at the extraction stage in order to verify method effectiveness. The surrogate was then analysed with the batch of samples and percentage recovery calculated.

10.2.4 Matrix Spike

Matrix spikes consisted of samples spiked with a known concentration of the analyte being measured, in order to identify properties of the matrix that may hinder method effectiveness. Samples were spiked with concentrations equivalent to 5 to 10 times the LOR and percentage recovery calculated.

10.2.5 Method Blanks

Method blanks (de-ionised water or clean sand) were carried through all stages of sample preparation and analysis at a rate of approximately 10%. Analyte concentrations in blanks should be less than the stated LOR. Reagent blanks were run if the method blank exceeded the LOR. The purpose of method blanks was to detect laboratory contamination.

10.3 Data Acceptance Criteria

The QA/QC Data will be assessed against the Data Acceptance Criteria (DAC) provided in **Table 10.1.**

Table 10.1: QA/QC Compliance Assessment

QA/QC Sample Type	Method of Assessment	Acceptable Range
Field QA/QC		
Blind Replicates and Split Samples	The assessment of split replicate is undertaken by calculating the Relative Percent Difference (RPD) of the replicate concentration compared with the original sample concentration. The RPD is defined as: $RPD = 100 \times \frac{\mid X1 – X2 \mid}{Average}$ Where: X1 and X2 are the concentration of the original and replicate samples.	The acceptable range depends upon the levels detected: ▪ 0 – 100% RPD (When the average concentration is < 5 times the LOR) ▪ 0 – 75% RPD (When the average concentration is 5 to 10 times the LOR) ▪ 0 – 50% RPD (When the average concentration is > 10 times the LOR)
Blanks (Rinsate and Trip Blanks)	Each blank is analysed as per the original samples.	Analytical Result < LOR
Laboratory-prepared Trip Spike	The trip spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70% - 130%
Laboratory QA/QC		
Laboratory Duplicates	Assessment as per Blind Replicates and Split Samples.	The acceptable range depends upon the levels detected: ▪ 0 – 100% RPD (When the average concentration is < 4 times the LOR) ▪ 0 – 50% RPD (When the average concentration is 4 to 10 times the LOR) ▪ 0 – 30% RPD (When the average concentration is > 10 times the LOR)
Surrogates Matrix Spikes Laboratory Control Samples	Assessment is undertaken by determining the percent recovery of the known spike or addition to the sample. $\% Recovery = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; C = Calculated Concentration.	▪ 70% - 130% (General Analytes) ▪ 50% - 130% (Phenols) ▪ 60% - 130% (OP Pesticides)

QA/QC Sample Type	Method of Assessment	Acceptable Range
Method Blanks	Each blank is analysed as per the original samples.	Analytical Result < LOR
Note: LOR = Laboratory Level of Reporting (LOR) or the minimum detection limit for a particular analyte.		

11 Quality Assurance and Quality Control

For the purpose of assessing the quality of data presented in this report, Jacobs collected and analysed various Quality Control (QC) samples (blind duplicate and blind triplicate sample), trip spike and trip blank samples, while the laboratory completed their own internal QC. The current section of this report is focused on the presentation of the results of these QC samples, adherence to Quality Assurance (QA) systems and discussion of deviations, if any from the DAC.

11.1 Field Quality Assurance

All samples were collected by experienced Jacobs environmental scientists and engineers, under established Jacobs protocols. Adherence to Jacobs protocols by experienced field staff trained in sample collection and handling techniques ensures the quality and representativeness of the samples collected.

11.2 Field Quality Control

The following QC samples were collected for laboratory analysis:

- Blind Duplicate: A2-QC01 (duplicate of soil sample A2-TP01_0.0), A2-QC03 (duplicate of soil sample A2-TP19_0.2), A2-QC05 (duplicate of soil sample A2-TP25_0.3), A2-QC07 (duplicate of soil sample A2-TP31_0.0) and A2-QC09 (duplicate of water sample A2-GW3)

- Split Replicate: A2-QC02 (duplicate of soil sample A2-TP01_0.0), A2-QC04 (duplicate of soil sample A2-TP19_0.2), A2-QC06 (duplicate of soil sample A2-TP25_0.3) and A2-QC08 (duplicate of soil sample A2-TP31_0.0)

- Trip Spike sample for soil and water – TS160517-1 (soil), TS160517-6 (soil) and TS160614-16 (water).

- Trip Blank sample for soil and water – TB160517-1 (soil), TB160517-6 (soil) and TB160614-16 (water).

Five blind duplicate samples (four soil samples and one water sample) were analysed to assess the quality control during the field sampling program. This equates to 7% blind duplicate soil analysis and 33% blind duplicate water analysis. This blind duplicate analysis exceeds and therefore conforms to the Australian Standard (AS 4482.1 - 2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* requirement of 5%.

The Relative Percentage Differences (RPDs) for all analytes for the blind duplicates taken during the soil sampling program conformed to the DAC with the exception of:

- Chromium (134 % RPD) between primary soil sample A2-TP01_0.0 and blind duplicate A2-QC01

- Nickel (113 % RPD) between primary soil sample A2-TP01_0.0 and blind duplicate A2-QC01

- Zinc (159 % RPD) between primary soil sample A2-TP01_0.0 and blind duplicate A2-QC01.

RPDs calculate the difference in magnitude between two samples and do not take into account the minor differences in actual concentrations. With respect to Chromium, Nickel and Zinc concentrations reported in samples A2-TP01_0.0 and A2-QC01, the concentrations reported represent values significantly lower than the SAC. The blind duplicate pair were collected from fill material. It is inherently difficult to obtain representative duplicate samples from heterogenous fill materials especially when they cannot be homogenised because of potential loss of volatiles.

As a conservative approach Jacobs have assessed soil quality using the higher reported concentration for Chromium, Nickel and Zinc (primary sample). It is unlikely that the exceedances of the RPDs for Chromium, Nickel and Zinc will affect the overall usability of the data set. RPD results for soil are presented in **Table C**.

The RPDs for all analytes for the blind duplicate pair taken during the groundwater monitoring program conformed to the DAC. RPD results for groundwater are presented in **Table D**.

Four split replicate samples for soil were analysed to assess the quality control during the field sampling program. This equates to 7% split replicate soil analysis. This split replicate analysis exceeds and therefore conforms to the Australian Standard (AS 4482.1 - 2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* requirement of 5%.

The Relative Percentage Differences (RPDs) for all analytes for the split replicates taken during the soil sampling program conformed to the DAC with the exception of:

- Chromium (139 % RPD) between primary soil sample A2-TP01_0.0 and split replicate A2-QC02
- Lead (125 % RPD) between primary soil sample A2-TP01_0.0 and split replicate A2-QC02
- Nickel (160 % RPD) between primary soil sample A2-TP01_0.0 and split replicate A2-QC02
- Zinc (171 % RPD) between primary soil sample A2-TP01_0.0 and split replicate A2-QC02.

RPDs calculate the difference in magnitude between two samples and do not take into account the minor differences in actual concentrations. With respect to Chromium, Lead, Nickel and Zinc concentrations reported in samples A2-TP01_0.0 and A2-QC02 the concentrations reported represent values significantly lower than the site assessment criteria. The split replicate pair were collected from fill material. It is inherently difficult to obtain representative duplicate samples from heterogenous fill materials especially when they cannot be homogenised because of potential loss of volatiles.

As a conservative approach Jacobs have assessed soil quality using the higher reported concentration for Chromium, Nickel and Zinc (primary sample) and Lead (secondary sample). It is unlikely that the exceedances of the RPDs for Chromium, Lead Nickel and Zinc will affect the overall usability of the data set. RPD results for soil are presented in **Table C**.

A split replicate for the water samples was not collected due to the small number of samples collected for laboratory analysis. In consideration of the low number of water samples collected, that all samples were collected by experienced personnel in accordance with documented procedures and that all other blind duplicate analysis and split replicate analysis (soils only) indicate useable data sets, the non-collection of a split replicate water sample is unlikely to affect the usability of the data.

One trip spike was submitted with each batch of soil and water samples delivered to the laboratory for analysis with the exception of soil samples delivered in Eurofins batch 501183. The trip spike samples were analysed for BTEX only. The trip spikes for soil and water returned concentrations of BTEX within the acceptable range (70% - 130%) as outlined in the DAC. Considering that all trip spike samples for soil returned concentrations of BTEX within the acceptable range and that all soil samples submitted for analysis reported concentrations of BTEX at or below the LOR and significantly below the adopted site assessment criteria, the absence of a trip spike sample for sample batch 501183 is unlikely to affect the usability of the data set.

One trip blank was submitted with each batch of soil and water samples delivered to the laboratory for analysis with the exception of soil samples delivered in Eurofins batch 501183. The concentrations of BTEX compounds in the trip blank were below the respective laboratory LORs and therefore conformed to the DAC. Considering that all trip blank samples for soil returned concentrations of BTEX below the respective laboratory LORs and that all soil samples submitted for analysis reported concentrations of BTEX at or below the LOR and significantly below the adopted site assessment criteria,, the absence of a trip blank sample for sample batch 501183 is unlikely to affect the usability of the data set.

No rinsate sample was collected from the decontaminated SPT sampler or submersible pump used for well development. In consideration that equipment decontamination and sampling was undertaken by experienced personnel in accordance with documented procedures and the general absence of significant contamination detected within soil samples collected using the SPT sampler and groundwater samples, the non-collection of rinsate samples is unlikely to affect the usability of the data.

11.3 Laboratory QA

All analysis was undertaken by a NATA accredited laboratory using NATA accredited analytical methods.

11.4 Laboratory QC

Laboratory QC data is presented in full in the laboratory certificates in **Appendix E.**

11.4.1 Laboratory Duplicates

RPDs for all laboratory duplicates for soil samples conformed to the DAC with the exception of:

- Chromium, RPD 49% (501564)
- Copper, RPD 45% (501564)
- Zinc, RPD 35% (501564)
- Arsenic, RPD 61% (502799)
- Arsenic, RPD 100% (502799)
- Arsenic, RPD 70% (502799)
- Chromium, RPD 31% (502799)
- Copper, RPD 32% (502799)
- Lead, RPD 35% (502799)
- Zinc, RPD 37% (502799)
- Chromium, RPD 46.7% (ES1611169).

The laboratory (Eurofins) applied the NEPM 2013 acceptance criteria of 0 – 30% for laboratory duplicate sample recoveries. Laboratory duplicate sample recoveries for Arsenic, Copper and Chromium in Eurofins batch 502799 and Lead and Zinc in Eurofins batch 502799 while not conforming to the NEPM 2013 acceptance criteria did conform to the laboratories (Eurofins) own laboratory acceptance criteria of no limit for when the results are < 10 times the LOR and also conformed to the Jacobs DAC of 0 – 100% when the average concentration is < 4 times the LOR. Considering that the laboratory duplicate sample recoveries complied with Eurofins NATA accredited acceptance criteria and the Jacobs DAC, the recoveries outlying the applied NEPM criteria are considered unlikely to affect the usability of the data set.

Laboratory duplicate sample recoveries for Chromium and Zinc in Eurofins batch 501564 while not conforming to the NEPM 2013 acceptance criteria did conform to the laboratories (Eurofins) own laboratory acceptance criteria of no limit for when the results are < 10 times the LOR and also conformed to the Jacobs DAC of 0 – 50% when the average concentration is 4 to 10 times the LOR. Considering that the laboratory duplicate sample recoveries complied with Eurofins NATA accredited acceptance criteria and the Jacobs DAC, the recoveries outlying the applied NEPM criteria are considered unlikely to affect the usability of the data set.

The laboratory duplicate sample recovery for Chromium in ALS batch ES1611169 while not conforming to the Jacobs DAC of 0 – 30% when the average concentration is > 10 times the LOR did conform to the laboratories (ALS) own laboratory acceptance criteria of 0 – 50% for when the results are 10 to 20 times the LOR. Considering that the laboratory duplicate sample recovery complied with ALS's NATA accredited acceptance criteria, the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

RPDs for all laboratory duplicates for water samples conformed to the DAC.

11.4.2 Laboratory Control Samples

Recoveries for all laboratory control samples for soil and water conformed to the DAC.

11.4.3 Surrogates

Recoveries for all laboratory surrogate samples for soil conformed to the DAC with the exception of:

- Dibutylchlorendate, Surrogate Recovery 138% for sample A2-TP12_0.0
- 13C-PFHxA, Surrogate Recovery 148% for sample A2-TP18_0.0
- 13C-PFHxA, Surrogate Recovery 133% for sample A2-TP21_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 61% for sample A2-TP24_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 59% for sample A2-TP24_0.5
- 4-Bromofluorobenzene, Surrogate Recovery 52% for sample A2-TP25_0.3
- 4-Bromofluorobenzene, Surrogate Recovery 64% for sample A2-TP26_0.0
- Dibutylchlorendate, Surrogate Recovery 68% for sample A2-TP24_0.0
- Tetrachloro-m-xylene, Surrogate Recovery 69% for sample A2-TP24_0.0

- Tetrachloro-m-xylene, Surrogate Recovery 67% for sample A2-TP26_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 56% for sample A2-TP26_1.0
- 4-Bromofluorobenzene, Surrogate Recovery 53% for sample A2-TP27_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 50% for sample A2-TP28_0.3
- 4-Bromofluorobenzene, Surrogate Recovery 50% for sample A2-TP29_0.0
- Dibutylchlorendate, Surrogate Recovery 56% for sample A2-TP29_0.0
- Tetrachloro-m-xylene, Surrogate Recovery 66% for sample A2-TP29_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 53% for sample A2-TP29_0.5
- 4-Bromofluorobenzene, Surrogate Recovery 54% for sample A2-TP30_0.2
- 4-Bromofluorobenzene, Surrogate Recovery 54% for sample A2-TP31_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 54% for sample A2-TP32_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 59% for sample A2-TP33_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 50% for sample A2-TP33_0.5
- 4-Bromofluorobenzene, Surrogate Recovery 54% for sample A2-QC05
- 4-Bromofluorobenzene, Surrogate Recovery 50% for sample A2-QC07
- Tetrachloro-m-xylene, Surrogate Recovery 65% for sample A2-TP33_0.0
- 4-Bromofluorobenzene, Surrogate Recovery 63% for sample A2-TP35_1.0
- Tetrachloro-m-xylene, Surrogate Recovery 61% for sample A2-TP34_0.0

The laboratory surrogate sample recoveries for Dibutylchlorendate in three samples (A2-TP12_0.0, A2-TP24_0.0 and A2-TP29_0.0), Tetrachloro-m-xylene in five samples (A2-TP24_0.0, A2-TP26_0.0, A2-TP29_0.0, A2-TP33_0.0 and A2-TP34_0.0) and 4-Bromofluorobenzene in 17 samples (A2-TP24_0.0, A2-TP24_0.5, A2-TP25_0.3, A2-TP26_0.0, A2-TP26_1.0, A2-TP27_0.0, A2-TP28_0.3, A2-TP29_0.0, A2-TP29_0.5, A2-TP30_0.2, A2-TP31_0.0, A2-TP32_0.0, A2-TP33_0.0, A2-TP33_0.5, A2-QC05, A2-QC07 and A2-TP35_1.0) while not conforming to the Jacobs DAC of 70 – 130% for general analytes did conform to the laboratories (Eurofins) own laboratory acceptance criteria of 50 – 150% for general analytes. Considering that the laboratory surrogate sample recoveries complied with Eurofins NATA accredited acceptance criteria and were only marginally above or below the Jacobs DAC limits the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

The laboratory surrogate sample recoveries 13C-PFHxA in two samples (A2-TP18_0.0 and A2-TP21_0.0) while not conforming to the Jacobs DAC of 70 – 130% for general analytes did conform to the laboratories (Eurofins) own laboratory acceptance criteria of 20 – 130% for PFAS. Considering that the laboratory surrogate sample recoveries complied with Eurofins NATA accredited acceptance criteria, the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

Recoveries for all laboratory surrogate samples for water conformed to the DAC with the exception of:

- 13C8-PFOS, Surrogate Recovery 42% for sample A2-GW1
- 13C8-PFOS, Surrogate Recovery 28% for sample A2-GW2
- 13C8-PFOS, Surrogate Recovery 21% for sample A2-GW3
- 13C8-PFOS, Surrogate Recovery 26% for sample A2-QC09.

The laboratory surrogate sample recoveries for 13C8-PFOS in four samples (A2-GW1, A2-GW2, A2-GW3 and A2-QC09) while not conforming to the Jacobs DAC of 70 – 130% for general analytes did conform to the laboratories (Eurofins) own laboratory acceptance criteria of 20 – 130% for PFAS. Considering that the laboratory surrogate sample recoveries complied with Eurofins NATA accredited acceptance criteria, the recoveries outlying the Jacobs DAC are considered unlikely to affect the usability of the data set.

11.4.4 Matrix Spikes

Recoveries for all matrix spike control samples for soil conformed to the DAC with the exception of:

- Pyrene, Spike Recovery 142%

The Matrix spike recovery for Pyrene while not conforming to the Jacobs DAC of 70-130% for general analytes did conform to the laboratory's (ALS's) own laboratory acceptance criteria of 52 – 148% for matrix spike samples for Pyrene. Considering that the recovery complied with ALS's NATA accredited acceptance criteria and were only marginally above the Jacobs DAC limits, the recovery outlying the Jacobs DAC is unlikely to affect the usability of the data set.

Matrix spike recoveries could not be determined for Zinc in ALS batch EM1606431 due to background levels greater than or equal to four times the spike level. Considering that all samples analysed for Zinc in the sample batch recorded concentrations either below the LOR or significantly below the adopted site assessment criteria the absence of matrix spike recoveries for Zinc in ALS batch EM1606431 is unlikely to affect the usability of the data set.

Recoveries for all matrix spike control samples for water conformed to the DAC.

11.4.5 Method Blanks

All method blanks for soil and water reported analyte concentrations below the laboratory LOR and therefore conformed to the DAC.

11.4.6 Sample Holding Times

All soil and water samples were extracted and analysed within the specified holding times.

11.4.7 Sample Condition

All samples were received by the analytical laboratories in correctly preserved and chilled containers with no reported breakages. The individual sample receipts are presented with the laboratory reports in **Appendix E.**

11.5 QA/QC Assessment

It is concluded that laboratory data are of acceptable quality and are considered useable in making conclusions and recommendations regarding the site.

12 Site Assessment Criteria

To address potential health and environmental impacts within the site, Jacobs compared the analytical test results against a set of health and ecological based soil investigation levels to be referred to as Site Assessment Criteria (SAC) considered to be appropriate for the proposed land use and main potential receptors of concern (i.e. airport and commercial/industrial guidelines, given the current and proposed land use and that any potential exposure times to possible contaminants during construction activities have been considered as short term).

That is, the SAC have been set at levels that provide confidence that contaminant concentrations below the SAC will not adversely affect human health or terrestrial/aquatic ecosystems.

The SAC developed for the investigation was derived (where applicable) from the following guidelines.

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as revised 2013) - *Schedule B1 Guideline on Investigation levels for Soil and Groundwater* (NEPC, 2013)
- Airports (Environment Protection) Regulations 1997 (the Airport Regulations)
- Western Australia Department of Health (May 2009) *Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA Guidelines)*
- GHD (June 2015) *Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework*
- National Health and Medical Research Council (2008) *Guidelines for Managing Risks in Recreational Waters* (NHMRC, 2008)
- enHealth (June 2016) *Guidance Statements on Pefluorinated Chemicals – Interim Values* (enHealth, 2016).

12.1 Aesthetics

Aesthetics on sites relates to the presence of observable odours, discoloration and erroneous wastes materials in soil which could possibly indicate contamination. Such olfactory evidence can point to how receptors can be impacted by vapours on and migrating from the site. Odour threshold for organic substances can be exceeded in off-site settings (through groundwater transmission of hydrocarbons) and whilst may not represent a direct health risk, could possibly prompt civil action. Aesthetics was continually assessed during the investigation and reported on the field logs (where present).

12.2 Ecological Investigation Levels

The site and surrounding areas comprise land used for airport purposes. As such ecological investigation levels (EILs) were considered for a commercial/industrial land use as part of this investigation.

EILs were generated using the NEPC (2013) – Volume 2 – Table 1B (1-7). For the Project, it has been assessed that the EILs will apply to contaminants within the top 2 metres of soil at the surface / ground level which corresponds to the root zone and habitation zone of many species. Additionally, typical background concentrations were required to be calculated in order to derive selected EILs. To generate the EILs for the investigation, Jacobs have used the methodology as described in **Appendix A** and summarised below.

EILs were generated for heavy metals, DDT and naphthalene. Sample A2_TP17_2.5 was assumed to be representative of the 'background concentration' for the soils within the site due to the sample being taken from natural soils, the depth of the sample (2.4 mbgl), and that the soil at this location was unlikely to be impacted by anthropogenic sources. The EILs were calculated (where appropriate) using the NEPC (2013) equation:

$$\mathbf{EIL = ABC^{1} + ACL^{2}}$$

In context of the Airport Regulation for the protection of soil ecosystems, soil analytical results have also been compared against Table 2 – areas of environmental significance.

A summary of the adopted EILs is presented as **Table 12.1**.

Table 12.1: Ecological Investigation Levels (expressed as mg/kg).

Substance	Ecological Investigation Levels	Airport Regulations [4]
Arsenic	160 [1]	20
Cadmium	3 [2]	3
Chromium	670 [3]	50
Copper	198.7 [3]	60
Lead	1,810 [3]	300
Mercury	1 [2]	1
Nickel	295 [3]	60
Zinc	425 [3]	200
DDT	640 [1]	0.97
Naphthalene	370 [1]	-
Total PCB	-	1
Aldrin	-	0.05
Dieldrin	-	0.2

[1] Generic EILs for aged arsenic/DDT/Naphthalene from **Table 1B(5).**

[2] EILs from NEPM 1999 (no EILs specified for contaminants in NEPM 2013).

[3] EILs derived from NEPM 2013 equation ABC+ACL.

[4] Levels from the Airport Regulations Table 2 – areas of environmental significance

12.3 Ecological Screening Levels

Ecological Screening Levels (ESLs) are focused on petroleum hydrocarbon and total recoverable hydrocarbon (TRH) compounds and are compared against actual site conditions (sub-surface materials and depth) to assess the potential risk to terrestrial ecosystems. For the purposes of calculating the ESLs, the generic soil type (i.e. three broad classes of sands, silts or clays) and land use need to be defined.

For the purposes of this assessment Jacobs considered clays to be most representative for the soil profile at the site.

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[1] ABC is ambient background concentration (the soil concentration in a specified locality that is the sum of the naturally occurring background level and the contaminant levels that have been introduced from diffuse or non-point sources by general anthropogenic activity).

[2] ACL is added contaminant limit (the added concentration (above the ABC) of a contaminant above which further appropriate investigation and valuation of the impact on ecological values is required).

Given the current and ongoing land use of commercial/industrial, the corresponding land use and associated ESL were used to determine the assessment criteria.

In context of the Airport Regulation for the protection of soil ecosystems, soil analytical results for hydrocarbon compounds have also been compared against Table 2 – areas of environmental significance.

Table 12.2 summarises the ESL criteria for soils that have been adopted.

Table 12.2: ESLs for Petroleum Based Fractions (expressed as mg/kg).

Compound / Fraction	Ecological Screening Levels[1]	Airport Regulations [2]
F1 (C6 – C10)	215	-
F2 (>C10 – C16)	170	-
F3 (>C16 – C34)	2,500	-
F4 (>C34 – C40)	6,600	-
Benzene	95	0.5
Toluene	135	3
Ethylbenzene	185	5
Xylenes	95	5
Benzo(a)pyrene	0.7	-
TPH (C6 - C9)	-	100
TPH (>C6)	-	1,000
Total PAH	-	5

[1] Table 1B(6) ESLs for TPH fractions F1 – F4, BTEX and Benzo(a)pyrene in soils - NEPM (2013).

[2] Levels from the Airport Regulations Table 2 – areas of environmental significance

12.4 Health Investigation Levels

To address potential health impacts at the site, Jacobs compared the analytical testing results against a set of health based Soil Investigation Levels (SILs) appropriate for commercial/industrial land use in context of the current and future land use as an airport and have taken into consideration the potential for contamination in soil to impact upon groundwater and generate vapours which could impact upon on human receptors. The health based SILs are a combination of Health Investigation Levels (HILs) and Health Screening Levels (HSLs) as detailed in the NEPM (2013) and the Accepted Limit/Trigger Levels detailed in Table 1 – areas of an airport generally of the Airport Regulations (1997). The adopted SILs are summarised in **Table 12.3**.

HILs have been developed for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of three metres below the surface for residential use.

HSLs have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physico-chemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to >4 metres. Further details on their use are provided in Friebel and Nadebaum (2011a, 2011b & 2011c).

The HSLs defined within the NEPC (2013) relate only to the volatile fractions of the petroleum hydrocarbons range i.e. BTEX, naphthalene and TRH C6 – C10, TRH C10 – C16.

Jacobs has adopted the lower value from the following criteria given that exposure times to contamination (if present) during construction are expected to be short term:

- NEPC (2013) Health Investigation Level recommended from exposure setting 'D' which includes premises such as shops, offices, factories and industrial sites (i.e. sites with minimal exposure opportunities).
- Friebel, E & Nadebaum, P (September 2011) Technical Report No.10, Health screening levels for petroleum hydrocarbons in soil and groundwater. Part 1: Technical development document - HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Worker (Table A4).

Table 12.3: Soil Investigation Levels (expressed mg/kg)

Contaminants	Soil investigation levels (HILs / HSLs)	
	Commercial / Industrial (D)	Airport Regulations
Metals/Metalloids		
Arsenic (total)	3,000 [1]	500
Cadmium	900 [1]	100
Chromium (III)	3,600 [1]	600,000
Copper	240,000 [1]	5,000
Lead	1,500 [1]	1,500
Mercury (inorganic)	730 [1]	75
Nickel	6,000 [1]	3,000
Zinc	400,000 [1]	35,000
Polycyclic Aromatic Hydrocarbons		
Carcinogenic PAHs (as B(a)P TEQ)	40 [1]	
Naphthalene	11,000 [3]	
B(a)P		5
Total PAHs	4,000 [1]	100
Total Recoverable Hydrocarbons		
TRH (C6-C9)		800
TRH (>C6)		5,000
>C16-C34	27,000 [3]	
>C34-C40	38,000 [3]	
Polychlorinated Biphenyls		
PCB	7 [1]	50
Organochlorine Pesticides		
DDT		1,000
DDD + DDE + DDT	3,600 [1]	
Aldrin		50
Aldrin and dieldrin	45 [1]	20
Dieldrin		20
Chlordane	530 [1]	250

Contaminants	Soil investigation levels (HILs / HSLs)				
	Commercial / Industrial (D)				Airport Regulations
Endosulfan	2,000 [1]				
Endrin	100 [1]				
Heptachlor	50 [1]				50
HCB	80 [1]				
Methoxychlor	2,500 [1]				
Mirex	100 [1]				
Toxaphene	160 [1]				
F1, F2 and BTEX (Based on a CLAY Soil Type) [4, #]					
Depth (m)	0 – <1m	1 – <2m	2 – <4m	>4m	
F1 (C6-C10*)	310	480	NL	NL	
F2 (>C10-C16*)	20,000 [3]				
Benzene	4	6	9	20	1
Toluene	99,000 [3]				130
Ethylbenzene	27,000 [3]				50
Xylenes	81,000 [3]				25

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct contact, Technical Report 10.

[4] NEPC (2013) Table 1A(3) Soil HSLs for Vapour Intrusion (mg/kg) HSL D Commercial / Industrial.

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

[#] Soil Vapour as the primary Exposure Pathway to impact potential receptors.

12.5 Management Limits

Within NEPC (2013), management limits are applied to petroleum hydrocarbons which are considered in addition to the SAC (HILs, EILs, ESLs etc). These Management Limits reflect the nature and properties of petroleum hydrocarbons and their potential effects such as:

- formation of observable light non-aqueous phase liquids (LNAPL)
- fire and explosive hazards
- effects on buried infrastructure e.g. penetration of, or damage to, in-ground services by hydrocarbons.

The application of the management limits will require site specific factors to be considered in more detail. These factors include, but not limited to, depth of building basements and services (where applicable) and depth to groundwater in order to determine the maximum depth to which the limits should apply. When the management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

The presence of site TRH contamination at the levels of the management limits does not imply that there is no need for administrative notification or controls in accordance with jurisdiction requirements. Adopted management limits for petroleum hydrocarbons are detailed in **Table 12.4**.

Table 12.4: Management Limits for TPH fractions F1–F4 in soil (adapted from NEPC 2013 Schedule B1)

TPH fraction	Soil texture	Management Limits[1] (mg/kg dry soil)
		Commercial and Industrial
F1[2] C_6- C_{10}	*Fine*	800
F2[2] >C_{10}-C_{16}	*Fine*	1,000
F3 >C_{16}-C_{34}	*Fine*	5,000
F4 >C_{34}-C_{40}	*Fine*	10,000

[1] Management limits are applied after consideration of relevant ESLs and HSLs

[2] Separate management limits for BTEX and naphthalene are not available hence these should not be subtracted from the relevant fractions to obtain F1 and F2.

12.6 Asbestos

The NEPM (2013) adopts guidelines for asbestos materials in soil as outlined in the WADOH (2009) guidelines. The WADOH (2009) guidelines were designed specifically to improve the characterisation of asbestos soil contamination and to manage human health risks now and into the future and specifically take the following practical positions into account:

- That overall, potential health impacts posed by different asbestos minerals, such as chrysotile and crocidolite, and fibre dimensions can be treated as equivalent
- ACM may pose a future free-fibre risk through its degradation, and therefore potential release of asbestos fibres
- The cancer risk from asbestos should be kept as low as practical and preferably no more than one occurrence in one million over a lifetime for the exposed population. Mesothelioma is used here as the most sensitive health impact of asbestos exposure.

The WADOH (2009) guideline values are based on extensive research by Swartjes and Tromp in the Netherlands (2008). The study resulted in the Netherlands introducing general regulatory investigation criteria of 0.01% w/w asbestos for fibrous asbestos and 0.1% w/w asbestos for non-friable ACM. The 0.01% criteria has the highest attendant risk (ie. Residential use) and is set at a level that should keep asbestos air levels below 0.001 fibres/millilitre (f/ml) and probably around 0.0001 f/ml. Using WHO (2000) risk figures for mesothelioma, 0.0001 f/ml corresponds to a lifetime risk of 10^{-6} to 10^{-5} in the exposed human population, which are risks that are considered broadly acceptable to the WADOH.

WADOH has used these Netherland figures and divided by a factor of 10 to derive the investigation criteria outlined in the WA guidelines. The factor of 10 takes into account the greater dryness and dust-generating potential of local soil and the fact that WADOH treats the mineralogical forms of asbestos as equivalent. The fibrous asbestos criterion applies to Friable Asbestos (FA) and Asbestos Fines (AF) due to their ability to generate asbestos fibre. WADOH applies even higher criteria for ACM, depending on the site use. These mirror the NEPM (2013) site uses and associated default exposure ratios.

Soil asbestos investigation criteria are outlined in **Table 12.5**.

Table 12.5: Soil Asbestos Investigation Criteria

Site Asbestos Investigation Criteria	Site Use
0.001% w/w asbestos for FA and AF	All site uses
0.05 % w/w asbestos for ACM	Commercial/Industrial
All forms of asbestos	No visible asbestos in surface soil [1]

[1] Investigation criteria from NEPM (2013)

Taking into account the current and proposed future land use for the site, Jacobs have adopted the soil asbestos investigation criteria for all land uses (for FA and AF), commercial/Industrial land use for ACM and no visible asbestos in surface soils as the SAC.

12.7 Perflourinated Chemicals (PFCs)

The Commonwealth and State regulatory framework for the management of PFC impacts to land is still under development. There are no screening criteria for PFCs for soil included in the NEPC (2013). There are no specific published NSW EPA guidelines or requirements for the assessment of PFC impacts or for the disposal of PFC impacted waste in NSW.

Jacobs has adopted SAC for PFCs and management approaches from the GHD (2015) guidelines relevant to a commercial/industrial land use.

The screening criteria relevant for this investigation are summarised in **Table 12.6** below.

Table 12.6: Selected Interim Screening Criteria for PFC

Exposure scenario	PFOS	PFOA	6:2FTS
Soil, human health – industrial	90 mg/kg	240 mg/kg	900 mg/kg
Ecological (terrestrial)	4.71 mg/kg (commercial/industrial – 60% species protection)	3.73 mg/kg	NA

12.8 Groundwater

Groundwater investigation levels (GILs) are the concentrations of a contaminant in groundwater above which further investigation (point of extraction) or a response (point of use) is required. GILs are based on Australian water quality guidelines and drinking water guidelines and are applicable for assessing human health risk and ecological risk from direct contact (including consumption) with groundwater.

The NSW EPA has endorsed the use of the water quality trigger levels given in the Australia and New Zealand Environment and Conservation Council (2000) *Australian and New Zealand guidelines for fresh and marine water quality* (ANZECC 2000) guidelines. These guidelines provide criteria for the protection of aquatic ecosystems (marine and fresh waters), primary industries, recreational water and drinking water.

The most likely environmental receptor of groundwater from the site would be the marine ecosystems of the Georges River located approximately 1 km to the west of the site. Based on information from the NSW Department of Environment, Climate Change and Water *NSW Water Quality and River Flow Objectives* (NSW DECCW, 2006) the Georges River is an estuarine environment down stream of Liverpool.

The NSW DECCW (2006) defines water quality objectives (WQO) for the Georges River. The areas surrounding the Georges River in the near vicinity of the site are characterised by urban developments. The NSW DECCW (2006) states that the WQO for the Georges River affected by urban development should be selected to protect aquatic ecosystems and recreational contact (both primary and secondary). It is noted in NSW DECCW (2006) that these WQOs may not be achievable in the short term and that the protection of primary recreational users may not be achievable.

From a review of the NSW Department of Primary Industries – Water Real Time Data database, no registered groundwater bores are located within a 0.5 km radius of the site. Based on the information above and the absence of known registered sensitive beneficial users of the groundwater down gradient from the site, the site assessment criteria (SAC) for groundwater should consider protection of environmental receptors. The most appropriate Groundwater Investigation Levels (GIL) are generally the 95% protection levels for marine water given in the ANZECC (2000) guidelines, although these are likely to be conservative in urbanised areas where waterways are degraded. Where the guideline does not provide these criteria or the guideline considers the 95% protection level is inappropriate, GILs have been sourced by using:

- The 99% protection levels for marine water ecosystems given in the ANZECC (2000) guidelines for contaminants considered to be bioaccumulative (e.g. cadmium, mercury, nickel)
- The 99% and 95% protection levels for freshwater ecosystems provided in the ANZECC (2000) guidelines (where applicable/available)
- NEPC (2013) prescribed GILs
- With respect to toluene and ethyl benzene the NSW EPA (1994) threshold concentrations for the protection of aquatic ecosystems.
- Nation Health and Medical Research Council (NHMRC) 2011 Australian Drinking Water Guidelines.
- The Dutch (2000) groundwater intervention levels for Total Petroleum Hydrocarbons fractions. The aromatic solvents criteria of 150µg/L was adopted for TRH (C6-C9) fraction and the mineral oil criteria of 600µg/L was adopted for TPH (C10-C36) fraction.

Depth to groundwater measured during the monitoring was between 2.146 m and 7.56 m bgl. For the purposes of this assessment Jacobs have based the GILs and groundwater health screening levels (HSLs) on a depth of between 2 and 4 m (shallowest groundwater depth range provided in NEPC (2013).

In addition schedule 2 (Water pollution – accepted limits) of the Airports (Environment Protection) Regulations 1997 outline the accepted limit of concentrations of contaminants for freshwater and marine water. The adopted GILs are summarised in **Table 12.7**.

Table 12.7: Groundwater Investigation Levels (expressed as µg/L)

Contaminants	Contaminant	Ecosystem protection levels – Marine	Airport Regulations
Heavy Metals	Arsenic	24 [3]	50
	Cadmium	0.7 [2]	2.0
	Chromium	4.4 [1]	50
	Copper	1.3 [1]	5.0
	Lead	4.4 [1]	5.0
	Mercury	0.1 [2]	0.1
	Nickel	7 [2]	15
	Zinc	15 [1]	50
BTEX Compounds	Benzene	500 [2]	300
	Ethyl Benzene	140 [4]	-
	Naphthalene	50 [2]	-
	Toluene	300 [4]	-
	Xylene (o)	350 [3]	-
	Xylene Total	380 [4]	-
Total Petroleum Hydrocarbons (TRH)	TRH C_6-C_9	150 [5]	-
	TRH C_{10}-C_{36}	600 [5]	-
Polycyclic Aromatic Hydrocarbons (PAHs)	Benzo(a)pyrene	0.01 [6]	-
	Naphthalene	50 [2]	-

Notes:
[1] ANZECC (2000) 95% of species protected – marine
[2] ANZECC (2000) 99% of species protected –marine
[3] ANZECC (2000) 95% of species protected – fresh water
[4] NSW EPA (1994) Protection of aquatic ecosystems - fresh water
[5] Dutch (2000) groundwater intervention levels
[6] NHMRC 2011 Australian Drinking Water Guidelines

HSLs for groundwater apply to exposure to petroleum hydrocarbons through the dominant vapour inhalation exposure pathway only.

The groundwater HSLs are based on three-phase equilibrium theory and vapour is limited by the maximum solubility limit of the chemical in the soil pore water phase or the groundwater. The soil saturation concentration of a particular contaminant is the condition where pore water is at its solubility limit and soil vapour is at the maximum vapour concentration. When a calculated HSL in groundwater exceeds this limit, the vapour in the soil or above groundwater cannot result in an unacceptable vapour risk and is denoted as NL (not limiting) in the HSL tables (Tables 1 A(3) – 1A(5)). HSLs for groundwater have been developed for sand, silt and clay soils based on the US soil texture classification system (Friebel & Nadebaum 2011a). The HSLs assume a uniform soil profile and the soil texture making up the greatest proportion of the soil profile should be used in selecting the appropriate HSLs (Friebel & Nadebaum 2011a and 2011b). Based on observations during the drilling and soil sampling program undertaken at the site, clay has been selected as the major soil type underlying the site.

The heavier end fractions, $>C_{16}$-C_{34} and $>C_{34}$-C_{40} are not volatile and as such are not included within the groundwater HSLs for vapour intrusion.

The adopted criteria for vapour intrusion relevant for this investigation are summarised in **Table 12.8** below.

Table 12.8: Groundwater HSLs for vapour intrusion (mg/L)

Contaminants	**Groundwater investigation levels (HILs / HSLs)**
	Commercial / Industrial (D)
F1, F2 and BTEX (*Based on a CLAY Soil Type*) [1,]	
Depth (m)	*2 – <4*
F1 (TRH C_6-C_{10})	NL
F2 (TRH >C_{10}-C_{16})	NL
Benzene	30,000
Toluene	NL
Ethylbenzene	NL
Xylenes	NL
Naphthalene	NL

1 NEPC (2013) Table 1 A(4) Groundwater HSLs for vapour intrusion –Commercial / Industrial, 2 to <4m, CLAY.

Soil Vapour as the primary Exposure Pathway to impact potential receptors

NL – No Limit: No limit exists for these contaminants based on the function of the solubility limit, the soil vapour and groundwater.

At the request of BAL, the significance of PFC in groundwater have been assessed against the GHD (June 2015) *Managing PFC Contamination at Airports, Interim Contamination Management Strategy and Decision Framework* prepared for Airservices Australia (GHD, 2015).

It should be noted that the guidelines for PFC in groundwater detailed in the GHD (2015) report are for the protection of groundwater as a potable water resource. At the time of preparing this report, there were no licensed potable users of groundwater within and/or immediately surrounding the Bankstown Airport site.

The adopted criteria for PFC compounds in groundwater are summarised in **Table 12.9**.

Table 12.9: Groundwater Investigation Levels (expressed as µg/L)

Contaminants	**Drinking Water**
8:2 Fluorotelomer sulfonate	0.4
6:2 Fluorotelomer Sulfonate (6:2 FtS)	5.0
PFOS	0.2
PFOA	0.4

13 Results

13.1 Site Stratigraphy

The sub-surface material encountered in the test pits (A2-TP01 to A2-TP35) and boreholes (A2-BH01 to A2-BH10 and A2-GW1 to A2-GW3) generally consisted of fill material comprising predominantly silty clay and minor gravelly clays and silty sands to a maximum depth of 1.0 m bgl overlying alluvial silty clays with occasional ferruginous gravel layers to a maximum depth of 10.45 m bgl.

13.2 Groundwater Flow Gradients

The heights (surveyed to site datum using a laser level) for all newly installed groundwater wells were surveyed to allow for the calculation of groundwater flow gradients. The position and heights (relative to site datum) of the groundwater wells and reduced groundwater levels are contained in **Table 13.1.**

Table 13.1: Groundwater Level Information

Well ID	Groundwater Level (m BTOC)	Relative Height (m TOC)	Relative Level of Groundwater (m)
A2-GW1	7.561	0.698	8.259
A2-GW2	3.908	1.723	5.631
A2-GW3	2.146	1.867	4.013

Notes:

- m BTOC – m below top of casing
- m TOC – m top of casing
- Relative level of groundwater reported as metres below site datum
- Groundwater levels as measured 20.06.16 and 21.06.16

The survey and groundwater level measurement indicated that groundwater flow direction is in a general north easterly direction. It may be possible that the significant rainfall event experienced at the site and subsequent localised flooding of the Georges River in the vicinity of the site prior to undertaking the groundwater monitoring influenced localised groundwater levels across the site. The flooding of the Georges River is likely to have created groundwater mounding in the vicinity of the river which would push groundwater away from the river. When river levels have stabilised, groundwater flow direction is expected to return towards the Georges River.

13.3 Aesthetics

A number of aesthetic issues (i.e. presence of erroneous wastes) were observed during the fieldwork program as detailed in **Table 13.2.**

Table 13.2: Aesthetic Issues.

Investigation Location	Depth (mbgl)	Aesthetic Issues
A2-TP12	0-0.3	Sandstone and asphalt inclusions
A2-TP13	0.1-0.5	Sandstone and aggregate inclusions
A2-TP14	0-0.1	Sandstone and wire inclusions
A2-TP14	0.1-0.5	Asphalt and concrete inclusions
A2-TP17	0.3-.06	Ash/charcoal inclusions
A2-TP20	0-0.3	Asphalt and concrete inclusions
A2-TP26	0.5-0.7	Sandstone and ash/charcoal inclusions

A2-TP27	0-0.2	Sandstone, concrete and ash/charcoal inclusions
A2-TP28	0-0.2	Sandstone, concrete and ash/charcoal inclusions
A2-TP29	0-0.2	Sandstone and glass inclusions
A2-TP33	0-0.1	Asphalt and aggregate inclusions
A2-TP34	0-0.1	Ash/charcoal inclusions
A2-TP35	0-0.1	Ash/charcoal inclusions

Although not observed at the specific sampling locations, isolated areas of lead shot were observed across the surface of the north western portion of the site (between the drainage swale and the taxiways).

Lead shot was observed at a number of the sample locations and this material was sampled accordingly. In other areas (as detailed above), the contamination status has been extrapolated based on observations and sample results for lead shot impacted materials.

Borehole and test pit logs are presented in **Appendix D.**

13.4 Soil Analytical Results

Soil analytical results from samples collected from test pits (A2-TP01 to A2-TP35) and boreholes (A2-BH01 to A2-BH10) are presented below and in **Table A.** Laboratory certificates of analysis are presented in **Appendix E.**

13.4.1 Heavy Metals

Concentrations of all heavy metals in all soil samples analysed were below the SAC with the exception of the following:

- Lead concentrations (760 mg/kg) detected in sample A2_TP12_0.0 exceeded the EIL (300 mg/kg)
- Lead concentrations (710 mg/kg) detected in sample A2_TP12_0.5 exceeded the EIL (300 mg/kg)
- Lead concentrations (910 mg/kg) detected in sample A2_TP13_0.0 exceeded the EIL (300 mg/kg)
- Lead concentrations (540 mg/kg) detected in sample A2_TP13_0.2 exceeded the EIL (300 mg/kg)
- Lead concentrations (710 mg/kg) detected in sample A2_TP15_0.0 exceeded the EIL (300 mg/kg)
- Lead concentrations (2,200 mg/kg) detected in sample A2_TP32_0.0 which exceed the both the EIL (1,815/300 mg/kg) and HIL (1,500 mg/kg)
- Nickel concentrations (110 mg/kg) detected in sample A2_TP33_0.0 exceeded the EIL (60 mg/kg).

13.4.2 Total Recoverable Hydrocarbons (TRH)

The concentrations of TRH compounds in all soil samples analysed were below the SAC with the exception of TRH (>C6) concentrations (1,130 mg/kg) detected in sample A2_TP12_0.0 which exceeded the EIL (1,000 mg/kg).

13.4.3 BTEX

The concentrations of BTEX compounds in all soil samples analysed were at or below the LOR and below the SAC.

13.4.4 Polycyclic Aromatic Hydrocarbons (PAHs)

Concentrations of all PAH compounds in all soil samples were below the SAC with the exception of the following:

- Benzo(a)pyrene concentrations (2.3 mg/kg) in sample A2_TP12_0.0 exceeded the ESL (0.7mg/kg)
- Benzo(a)pyrene concentrations (2.7 mg/kg) in sample A2_TP14_0.3 exceeded the ESL (0.7mg/kg)
- Benzo(a)pyrene concentrations (2.4 mg/kg) in sample A2_TP15_0.0 exceeded the ESL (0.7mg/kg)
- Benzo(a)pyrene concentrations (1.4 mg/kg) in sample A2_TP20_0.0 exceeded the ESL (0.7mg/kg).

13.4.5 Organochlorine Pesticides (OCPs)

The concentrations of OCP compounds in all soil samples analysed were below the LOR and below the SAC.

13.4.6 Polychlorinated Biphenyls (PCB)

The concentrations of PCB compounds in all soil samples analysed were below the LOR and below the SAC.

13.4.7 Perfluorinated Compounds (PFC)

The concentrations of PFC compounds in all soil samples analysed were below the SAC.

Sample locations exceeding the respective SAC are presented in **Figure 3-2**.

13.5 Asbestos Analytical Results

Soil analytical results from samples collected from 22 test pits (A2-TP02, A2-TP04, A2-TP06, A2-TP07, A2-TP08, A2-TP10, A2-TP11, A2-TP12, A2-TP13, A2-TP15, A2-TP17, A2-TP18, A2-TP20, A2-TP21, A2-TP22, A2-TP23, A2-TP24, A2-TP26, A2-TP29, A2-TP33, A2-TP34, A2-TP35) are presented below and in **Table A.** Laboratory certificates of analysis are presented in **Appendix E**.

13.5.1 Asbestos Analysis of Soil Bulk Samples

Asbestos analytical results for the soil bulk samples are presented below and in **Table A**. Laboratory certificates of analysis are presented in **Appendix E.**

Trace analysis of asbestos in all soil bulk samples analysed reported no detectable asbestos with the exception of sample A2_TP17_0.0. Analysis for AF, FA and ACM for all samples analysed recorded results of no visible asbestos identified with the exception of AF (0.0025 grams, estimated AF concentration of 0.0002% w/w) detected in sample A2_TP17_0.0. The estimated AF concentration was below the SAC.

Laboratory calculated concentrations for ACM, AF and FA and total asbestos in the 22 soil samples reported results below the laboratory LOR.

Trace analysis of asbestos in the additional soil bulk samples (A2_TP17N, A2_TP17E, A2_TP17S and A2_TP17W) analysed reported no detectable asbestos with the exception of sample A2_TP17N. Analysis for AF, FA and ACM for all samples analysed recorded results of no visible asbestos identified with the exception of AF (0.0196 grams, estimated AF concentration of 0.0014% w/w) detected in sample A2_TP17N. The estimated AF concentration was above the SAC of 0.001% w/w.

13.5.2 Asbestos Concentration in Soil

Asbestos (based on visual observations during the fieldwork and laboratory analysis) was not identified at any of the 22 test pit locations in material observed and sampled from 0.0 – 1.0 m (strata A).

13.5.3 Inspection and Analysis of Surface Soils

A visual inspection of surface soils for potential ACM fragments was undertaken at each of the 35 test pit locations (where possible) prior to the commencement of excavations. Where the surface of the site and surface soils were visible, no potential ACM fragments were observed at or in the near vicinity of the sampling locations.

Sample locations exceeding the respective SAC are presented in **Figure 3-2**.

13.6 Groundwater Analytical Results

Groundwater analytical results from samples collected from groundwater wells A2-GW1, A2-GW2 and A2-GW3 are presented below and in **Table B**. Laboratory certificates of analysis are presented in **Appendix E.**

13.6.1 General Water Quality Parameters

The general water quality parameters measured at the respective groundwater well locations indicated the following:

- pH ranged from 4.43 pH units (A2-GW3) to 7.05 pH units (A2-GW1)
- Electrical conductivity ranged from 15,403 µS/cm (A2-GW1) to 21,157 µS/cm (A2-GW2)
- Temperature ranged from 17.5 oC (A2-GW3) to 19.3 oC (A2-GW2)
- Dissolved oxygen levels ranged from 2.32 mg/L (A2-GW2) to 4.42 mg/L (A2-GW1)
- Redox potential ranged from 81.3 mV (A2-GW1) to 230.8 mV (A2-GW3).

Groundwater field data sheets are provided in **Appendix C**.

Field water quality parameters indicated that groundwater beneath the site was slightly acidic. The EC of the groundwater beneath the site was generally brackish to saline. ORP measurements were generally consistent across the site and indicated an oxidizing potential.

13.6.2 Heavy Metals

Concentrations of all dissolved heavy metals in all samples were low or below the LOR and below the SAC with the following exceptions:

- Copper concentrations exceeded the SAC of 1.3 µg/L and the airport regulations criteria of 5 µg/L in the groundwater sample analysed from A2-GW3 (14 µg/L).

- Lead concentrations exceeded the SAC of 4.4 µg/L and the airport regulations criteria of 5 µg/L in the groundwater sample analysed from A2-GW3 (18 µg/L).

- Nickel concentrations exceeded the SAC of 7 µg/L and the airport regulations criteria of 15 µg/L in groundwater samples analysed from A2-GW2 (34 µg/L) and A2-GW3 (210 µg/L).

- Zinc concentrations exceeded the SAC of 15 µg/L in the groundwater sampled from A2-GW2 (44 µg/L) and the SAC and the airport regulations criteria of 50 µg/L in the groundwater sampled from A2-GW3 (170 µg/L).

13.6.3 Total Recoverable Hydrocarbons (TRH)

Concentrations of all TRH compounds in all samples analysed were below the LOR and below the SAC.

13.6.4 BTEX

Concentrations of all BTEX compounds in all samples analysed were below the LOR and below the SAC.

13.6.5 Polycyclic Aromatic Hydrocarbons (PAHs)

Concentrations of all PAH compounds in all samples analysed were below the LOR and below the SAC.

13.6.6 Perfluorinated Compounds (PFCs)

Concentrations of all PFC compounds in all samples analysed were below the SAC.

14 Discussion

14.1 Soil

Samples of soil / fill material collected from the test pits and boreholes were analysed for contaminants of concern which could be associated with the former and current use of the site for airport purposes.

The following aesthetic issues were identified at the site:

- Isolated areas of lead shot were also observed across the surface of the north western portion of the site (between the drainage swale and the taxiways)

- Miscellaneous materials (i.e. sandstone and general building wastes) were observed in A2-TP12, A2-TP13, A2-TP14, A2-TP17, A2-TP20, A2-TP26, A2-TP27, A2-TP28, A2-TP29, A2-TP33, A2-TP34 and A2-TP35. The majority of these miscellaneous materials were observed across the northern and southern portions of the site.

No aesthetically unsuitable materials were observed in the natural soils underlying the fill material at the site.

Soil samples from test pits and boreholes were selected for analysis based generally on providing vertical and lateral coverage of potential contaminant extents and on visual observations. The majority of soil samples recorded contaminant concentrations below the adopted SAC. A small number of samples reported concentrations of contaminant compounds above adopted ecological investigation and screening levels. The benzo(a)pyrene detected at concentrations above ecological screening levels in a number of samples are likely to be associated with asphalt inclusions identified in the fill material across the site. In context of the likely development at the site (comprising commercial/industrial facilities with minimal landscaping opportunities), these exceedances are unlikely to impact upon the development or continued use of the site for airport related activities.

A sample collected from surface soils at test pit location A2-TP32 (located within the north western portion of the site) reported lead concentrations of 2,200 mg/kg which exceeds the health investigation levels of 1,500 mg/kg. Surface soils at locations A2-TP12, A2-TP13 and A2-TP15 reported lead concentrations above the ecological investigation levels (300 mg/kg) detailed in Table 2 – areas of environmental significance of the Airport Regulations. Nickel was also detected in the surface sample collected from A2_TP33_0.0 at concentrations exceeding the ecological investigation levels detailed in Table 2 – areas of environmental significance of the Airport Regulations. These locations are in the near vicinity to where isolated lead shot was observed across the surface of the site and therefore the elevated lead concentrations could be associated with lead shot (fragment or whole shot) being present in the sample collected. It is also likely that elevated lead concentrations would also be present in areas where lead shot was observed in surface soils (i.e. across the north western portion of the site). In context of the likely development at the site (comprising commercial/industrial facilities with minimal landscaping opportunities), elevated lead and nickel concentrations and visible lead shot in surface soils located within the north western portion of the site could impact upon the development or continued use of the site for airport related activities.

Asbestos fines were identified in surface soils sampled from A2-TP17 and A2-TP17N. The estimated concentration of asbestos fines in A2-TP17N was above the SAC. Considering that no asbestos (as ACM) was identified in the fill material across the site and asbestos fines were only detected in two adjacent soil sample locations, the asbestos fines are likely to be localised to the areas immediately surrounding A2-TP17 and A2-TP17N. Asbestos fines in surface soils are more likely to be liberated (in comparison to ACM) as a result of ground disturbance which could increase the exposure risk to site users (construction workers or airport personnel) from asbestos fibres.

14.2 Groundwater

The groundwater monitoring results indicated that the concentrations of compounds detected in groundwater wells subjected to monitoring were below the adopted SAC and airport regulations with the exception of pH (A2-GW2 and A2-GW3 only) copper, lead, nickel and zinc in A2-GW2 (nickel and zinc only) and A2-GW3. Higher concentrations of nickel and zinc were detected in A2-GW3 in comparison to the concentrations reported in A2-GW2.

pH levels in groundwater across the site were generally low with two locations (A2-GW2 and A2-GW3) reporting levels below the lower criteria (pH 6.5) detailed in the Airport Regulations. pH levels reported in A2-GW1 were 7.05. It should be noted that only one round of field chemistry testing was undertaken from A2-GW1 to ensure that sufficient volume was available for sampling as the well exhibited extremely low recharge. It is possible that this well could have recorded lower pH levels if additional field chemistry testing was possible. With the absence of known activities which could affect pH levels present surrounding the groundwater well locations, lower pH levels could be attributable to a localised natural occurrence across the site. Additionally, the actual quality of groundwater is likely to have been influenced by heavy rainfall and flooding events which occurred prior to sampling. With generally low pH levels detected in groundwater across the site (i.e. likely to be representative of background levels), the lower pH reported in wells A2-GW2 and A2-GW3 are unlikely to represent a risk to groundwater receptors.

The source of the metals detected in A2-GW2 and A2-GW3 are not known and copper, nickel and zinc were not detected in soils at the site at concentrations exceeding the SAC. Lead was detected at elevated concentrations at A2-TP32, however this location is down gradient from wells A2-GW2 and A2-GW3. These isolated exceedances of the SAC for copper, lead, nickel and zinc in groundwater are unlikely to require specific remediation and/or management.

It is acknowledged that the groundwater flow gradients may be affected by rainfall events and localised flooding of the Georges River prior to undertaking the monitoring event.

15 Conclusions and Recommendations

Jacobs have undertaken the contamination investigation of Site 2 (Drover Road) located on a portion of airside land at Bankstown Airport, NSW.

Based on site observations and the results of the laboratory analysis, some contamination is present at the site which will need to be considered in context of the development of the site and ongoing airport land use as detailed below.

Lead and nickel concentrations in surface soils and areas of observable lead shot within the north western portion of the site will require remediation and/or management.

Based on the results of the investigation, it is unlikely that extensive asbestos fine contamination is present at the site. However in consideration of the increased risk of asbestos fibre liberation during ground disturbance from asbestos fines (compared to bonded ACM) it is recommended that remediation of surface soils surrounding A2-TP17 and A2-TP17N be undertaken.

There were some exceedances of groundwater guideline levels for pH, copper, lead, nickel and zinc. While the exceedance of the guideline levels is considered unlikely to impact upon the construction of the proposed facilities, should dewatering of excavations be required to facilitate construction, the water may require some treatment or management.

The presence of general building waste observed across the site could indicate potential contamination within this material in areas not tested as part of this investigation. To manage potential contamination, it is recommended that an unexpected finds protocol be developed and implemented during construction to manage potentially contaminated materials, should they be identified.

16 Limitations

The sole purpose of this report and the associated services performed by Jacobs is to assess the condition of the site (with respect to soil and groundwater contamination) in accordance with the scope of services set out in the contract between Jacobs and Bankstown Airport Limited (the Client). That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Client (if any), from observations made during the investigations and data from analytical laboratories. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs’ Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

Figures

JACOBS NSW SPATIAL - GIS MAP file : IA110700_Figure1-2_Site2Locality_r1v1 | 6/07/2016

Legend

▨ Site 2 Location (approx.)

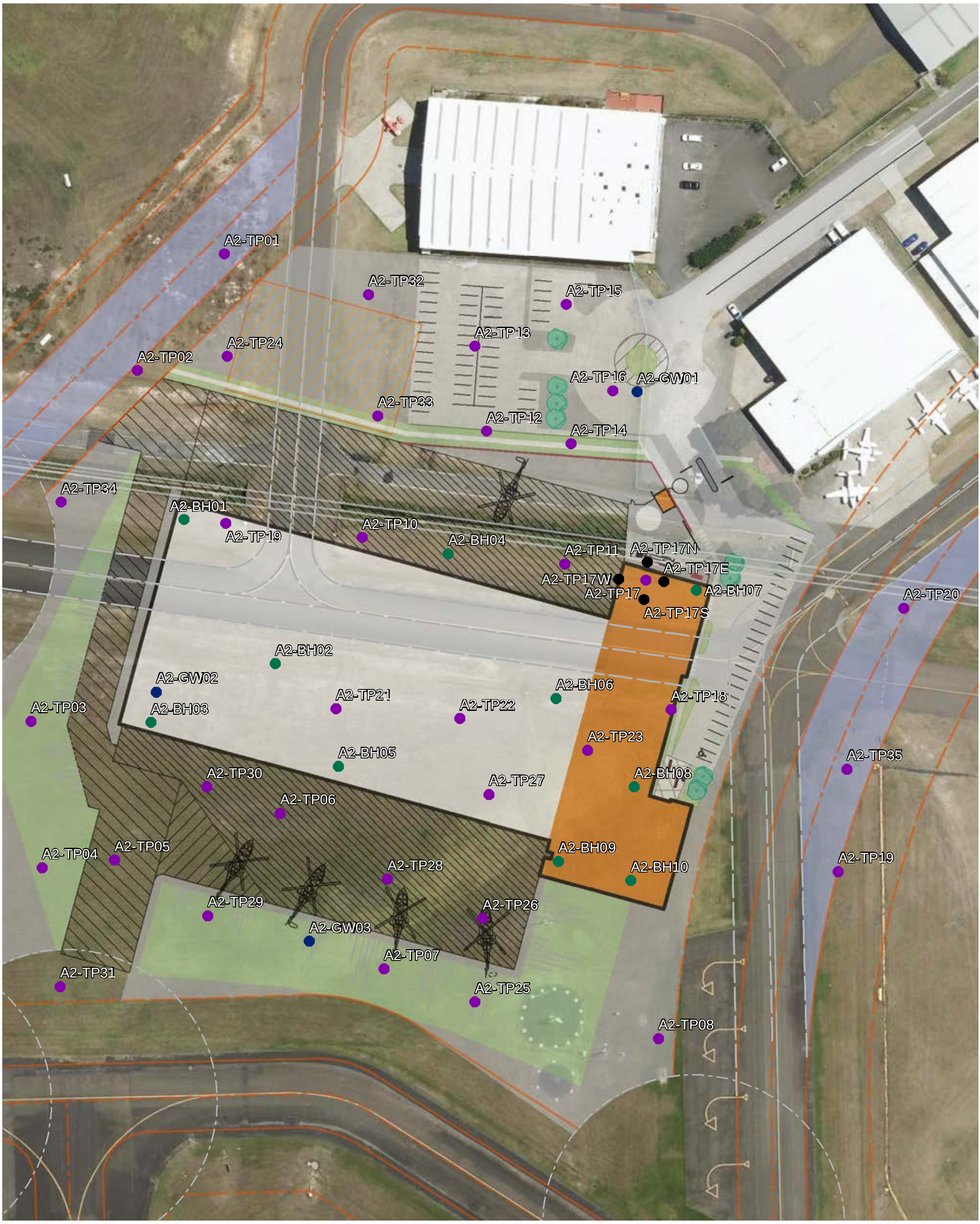
0 100 200m

N

1:5,000 @ A4

Data sources
Jacobs 2015
Ausimage 2014
RMS 2015
LPI 2015
© Land and Property Information 2015

Figure 1-2 | Site Location



JACOBS NSW SPATIAL - GIS MAP file : IA110700_Figure2-2_Site2SamplingLocations_r1v5 | 24/08/2016

Legend

● Borehole
● Groundwater Well
● Test Pit
● Additional Asbestos Fines
▨ Forecourt
▨ Plane Parking Area
▨ Future Hangards (x2)
▨ Road/Carpark
▨ Walkway
▨ Adjusted/New Taxiway
▨ Building
▨ Wall
☐ Hanger
▨ Landscaping

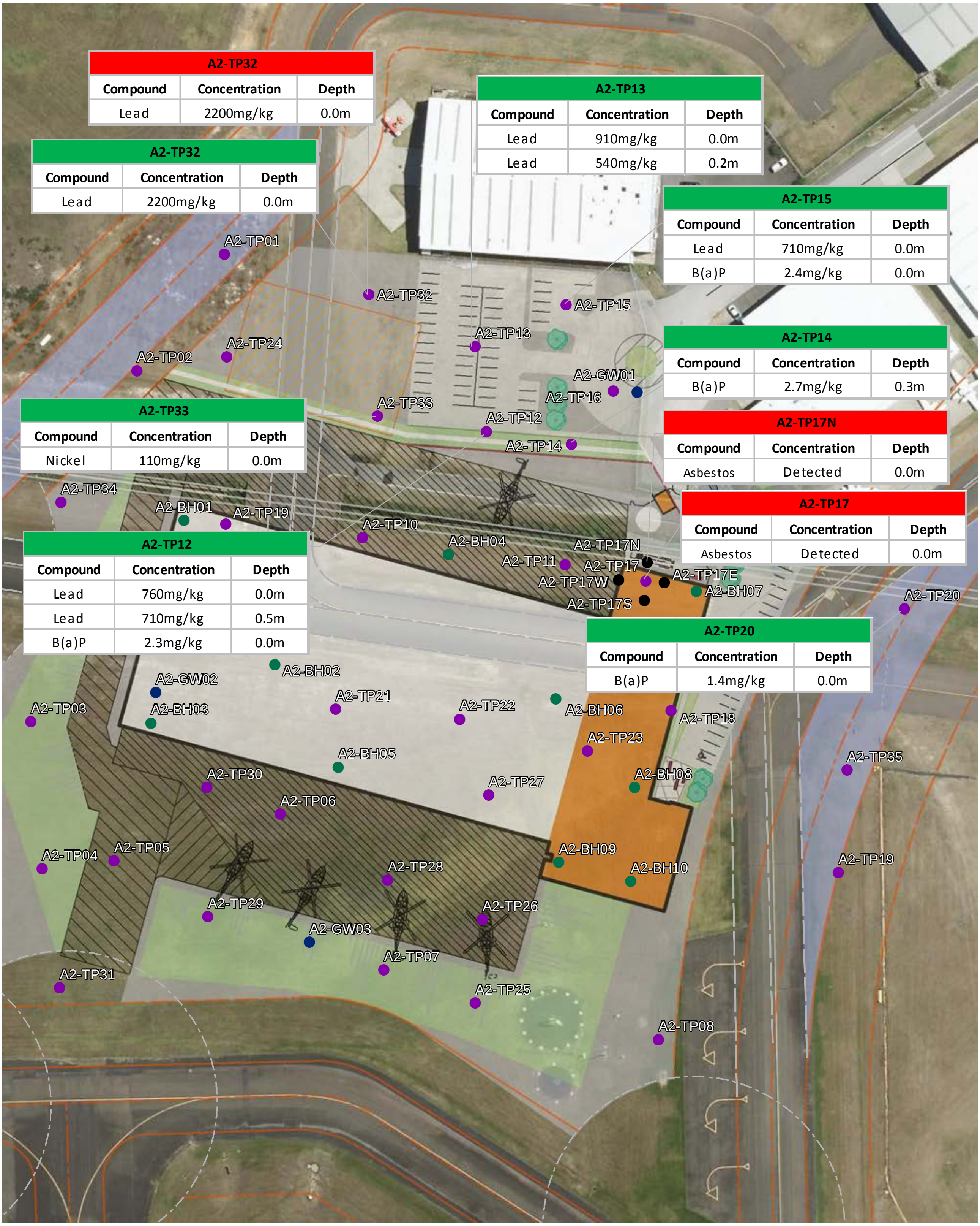
0 20 40m

N

1:1,500 @ A4

Data sources
Jacobs 2015
Ausimage 2014
RMS 2015
LPI 2015
© Land and Property Information 2015

Figure 2-2 | Bankstown Airport - Site 2



A2-TP32

Compound	Concentration	Depth
Lead	2200mg/kg	0.0m

A2-TP32

Compound	Concentration	Depth
Lead	2200mg/kg	0.0m

A2-TP13

Compound	Concentration	Depth
Lead	910mg/kg	0.0m
Lead	540mg/kg	0.2m

A2-TP15

Compound	Concentration	Depth
Lead	710mg/kg	0.0m
B(a)P	2.4mg/kg	0.0m

A2-TP14

Compound	Concentration	Depth
B(a)P	2.7mg/kg	0.3m

A2-TP17N

Compound	Concentration	Depth
Asbestos	Detected	0.0m

A2-TP33

Compound	Concentration	Depth
Nickel	110mg/kg	0.0m

A2-TP17

Compound	Concentration	Depth
Asbestos	Detected	0.0m

A2-TP12

Compound	Concentration	Depth
Lead	760mg/kg	0.0m
Lead	710mg/kg	0.5m
B(a)P	2.3mg/kg	0.0m

A2-TP20

Compound	Concentration	Depth
B(a)P	1.4mg/kg	0.0m

JACOBS NSW SPATIAL - GIS MAP file : IA110700_Figure3-2_ExceedancesOfSACSite2_r1v2 | 7/07/2016

Legend

●	Borehole	🟥	Concentration exceed HIL
●	Groundwater Well	🟩	Concentration exceed EIL
●	Test Pit		
●	Additional Asbestos Fines		

0 20 40m

N

1:1,500 @ A4

Data sources
Jacobs 2015
Ausimage 2014
RMS 2015
LPI 2015
© Land and Property Information 2015

Figure 3-2 | Exceedances of SAC - Site 2

Tables

Table A - Soil Analytical Results

		Reference	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM Table 1B(6) ESLs Commercial and Industrial	**NEPM 2013 Table 1B(7) Management Limits for TPH fractions in soil**	*Airport Regulations*	501564	501183	501183	501564	501183	501183	501183	501183	501183	501183	501564	501564	501564	501564	501183	501183	501183	501183	501183	501183	501183	501183	501183	501183	501183	501564
		Sample date					19/05/2016	17/05/2016	17/05/2016	19/05/2016	16/05/2016	17/05/2016	18/05/2016	18/05/2016	16/05/2016	16/05/2016	19/05/2016	20/05/2016	20/05/2016	20/05/2016	17/05/2016	17/05/2016	17/05/2016	17/05/2016	16/05/2016	16/05/2016	16/05/2016	16/05/2016	16/05/2016	16/05/2016	16/05/2016	20/05/2016
		Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Sample ID					A2_BH1_1.5	A2_BH2_0.0	A2_BH3_1.5	A2_BH4_0.0	A2_BH5_0.5	A2_BH6_0.5	A2_BH7_0.0	A2_BH8_0.5	A2_BH9_0.0	A2_BH10_0.5	A2_TP01_0.0	A2_TP02_0.0	A2_TP02_0.2	A2_TP02_0.5	A2_TP03_0.3	A2_TP04_0.0	A2_TP04_0.5	A2_TP05_0.0	A2_TP06_0.0	A2_TP06_0.2	A2_TP07_0.0	A2_TP07_0.1	A2_TP07_0.5	A2_TP08_0.0	A2_TP08_0.3	A2_TP09_0.3
ChemName	**Units**	**EQL**																														
Metals																																
Arsenic	mg/kg	2	3000[1]	160[4]		*500[6] / 20[12]*	5	<2	4	4.8	4.7	5.8	2	5.6	5	5.3	5.8	3.8	-	4.6	3.9	4.9	4.3	6.2	10	2	3.2	-	6	-	2.4	7.1
Cadmium	mg/kg	0.4	900[1]	3[8]		*100[6] / 3[12]*	<0.4	<0.4	<0.4	0.7	1.7	<0.4	0.8	<0.4	<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	-	<0.4	-	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	3600[1]	666.6[9]		*600,000[6] / 50[12]*	7.1	<5	8.6	12	12	11	10	17	9.6	13	50	19	-	24	5.4	17	17	10	32	7.8	8	-	19	-	6.6	15
Copper	mg/kg	5	240,000[1]	315[9]		*5000[6] / 60[12]*	9.6	<5	14	10	<5	9.3	8.8	9.9	6.4	12	<5	12	-	5.4	<5	12	6.6	5.5	6	<5	13	-	8.8	-	<5	9.4
Lead	mg/kg	5	1500[1]	1815[9]		*1500[6] / 300[12]*	7.9	7.5	12	39	12	9.3	21	9	22	13	183	210	-	8.2	10	27	12	20	28	14	32	-	8.1	-	11	63
Mercury	mg/kg	0.05	730[1]	1[8]		*75[6] / 1[12]*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.42	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.17	-	<0.05	-	<0.05	<0.05
Nickel	mg/kg	5	6000[1]	465[9]		*3000[6] / 60[12]*	<5	<5	<5	<5	<5	<5	8.6	<5	<5	<5	18	11	-	5.1	<5	9.6	<5	<5	5.6	<5	5.4	-	<5	-	<5	<5
Zinc	mg/kg	5	400,000[1]	1114[9]		*35,000[6] / 200[12]*	7.7	<5	5.2	35	200	<5	33	6.5	15	<5	64	47	-	11	<5	30	<5	8.7	22	6.3	37	-	<5	-	<5	23
Organochlorine Pesticides (OCPs)																																
4,4-DDE	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
a-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Aldrin	mg/kg	0.05				*50[6] / 0.05[12]*	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Aldrin + Dieldrin	mg/kg		45[1]			*20[6]*	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	-
b-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
chlordane	mg/kg	0.1	530[1]			*250[6]*	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	<0.1	-	-	-	-	-
d-BHC	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
DDD	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
DDT	mg/kg	0.05		640[4]		*1000[6] / 0.97[12]*	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
DDT+DDE+DDD	mg/kg		3600[1]				-	-	-	-	-	-	-	-	-	-	-	<0.15	-	-	-	<0.15	-	-	<0.15	-	<0.15	-	-	-	-	-
Dieldrin	mg/kg	0.05				*20[6] / 0.2[12]*	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Endosulfan I	mg/kg	0.05	2000[1]				-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Endosulfan II	mg/kg	0.05	2000[1]				-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Endrin	mg/kg	0.05	100[1]				-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Endrin ketone	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Heptachlor	mg/kg	0.05	50[1]			*50[6]*	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05					-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05	80[1]				-	-	-	-	-	-	-	-	-	-	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-
Methoxychlor	mg/kg	0.05	2500[1]				-	-	-	-	-	-	-	-	-	-	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	<0.2	-	-	-	-	-
Toxaphene	mg/kg	1	160[1]				-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	<1	-	-	<1	-	<1	-	-	-	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																																
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		0.7[5]		*5[6]*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5					0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	40[1]				1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2	-	1.2	1.2
Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Chrysene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	4000[1]			*100[6] / 5[12]*	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Phenanthrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Polychlorinated Biphenyls (PCBs)																																
Arochlor 1016	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
Arochlor 1242	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
Arochlor 1248	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
Arochlor 1254	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
Arochlor 1260	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1				*1[12]*	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	<0.5	-	-	<0.5	-	<0.5	-	-	-	-	-
TRH - Semivolatile Fraction																																
C10-C16	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	<50	<50
C16-C34	mg/kg	100	27,000[3]	2500[5]	**5000[7]**		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	<100	<100	<100	<100	<100	<100	<100	<100	-	<100	-	<100	<100
C34-C40	mg/kg	100	38,000[3]	6600[5]	**10,000[7]**		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	<100	<100	<100	<100	<100	<100	<100	<100	-	<100	-	<100	<100
F2-NAPHTHALENE	mg/kg	50	20,000[3]	170[5]	**1000[7]**		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	<50	<50
C10 - C14	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	<20	<20
C15 - C28	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	<50	<50
C29-C36	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	54	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	<50	<50
+C10 - C36 (Sum of total)	mg/kg	50				*1,000[12]*	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	54	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	-	<50	<50
TRH / BTEX																																
Benzene	mg/kg	0.1	4[2]	95[5]		*1[6] / 0.5[12]*	<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	-	<0.1	-	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	27,000[3]	185[5]		*50[6] / 5[12]*	<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	-	<0.1	-	<0.1	<0.1
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5
Toluene	mg/kg	0.1	99,000[3]	135[5]		*130[6] / 3[12]*	<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	-	<0.1	-	<0.1	<0.1
Xylene (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	-	<0.2	<0.2
Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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
Xylene Total	mg/kg	0.3	81,000[3]	95[5]		*25[6] / 5[12]*	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	-	<0.3	<0.3
C6 - C9	mg/kg	20				*800[6] / 100[12]*	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	<20	<20
C6-C10 less BTEX (F1)	mg/kg	20	310[2]	215[5]	**800[7]**		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	<20	<20
C6-C10	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	-	<20	<20
Perfluorinated Compounds (PFCs)																																
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.01	900[10]				-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.005	90[10]	4.71[10]			-	-	-	-	-	-	-	-	-	-	-	0.34	-	-	-	<0.005	-	-	<0.005	-	<0.005	-	-	-	-	-
Perfluorooctanoate	mg/kg	0.005	240[10]	3.73[10]			-	-	-	-	-	-	-	-	-	-	-	<0.005	-	-	-	<0.005	-	-	<0.005	-	<0.005	-	-	-	-	-
Asbestos																																
Asbestos from ACM in Soil	%w/w		0.05[11]				-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	-	-	-	0	-	0	-	0	-	-
Asbestos from FA & AF in Soil	%w/w	0.001	0.001[11]				-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	<0.001	-	-	-	<0.001	-	<0.001	-	<0.001	-	-
Mass ACM	g						-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	-	-	-	0	-	0	-	0	-	-
Mass AF	g						-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	-	-	-	0	-	0	-	0	-	-
Mass FA	g						-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0	-	-	-	0	-	0	-	0	-	-
Asbestos Fibres							-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	ND	-	-	-	ND	-	ND	-	ND	-	-
% Clay	%	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					15	5	18	11	12	18	5.1	19	8.8	18	11	8.8	-	23	5.2	14	21	18	10	4.6	16	-	25	-	18	9.7
pH (Lab)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct contact, Technical Report 10.

[4] NEPC (2013) Generic calculated EIL from Table 1B(5) Commercial and Industrial.

[5] NEPC (2013) Table 1 B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial

[6] Airports (Environment Protection) Regulations 1997

[7] NEPC (2013) Table 1B(7) Management Limits for TPH fractions F1 - F4 in soil - Commercial and Industrial

[8] NEPM 1999 generated EILs (no EIL provided in NEPC 2013)

[9] EILs derived from NEPM 2013 equation ABC+ACL.

[10] GHD (2015) Table 1 Interim Screening Levels (ISLs), Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework

[11] WA DOH (2009) Soil asbestos investigation criteria

[12] Airports (Environment Protection) Regulations 1997 - Table 2 Areas of environmental significance

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

Table A - Soil Analytical Results

		Reference	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM Table 1B(6) ESLs Commercial and Industrial	NEPM 2013 Table 1B(7) Management Limits for TPH fractions in soil	*Airport Regulations*	501564	501564	501564	501564	501564	501564	501564	501564	501564	501564	501564	501564	501564	501183	151807	151807	151807	151807	501183	501183	501183	501564	501564	501564	501183	501183
		Sample date					19/05/2016	19/05/2016	19/05/2016	19/05/2016	20/05/2016	20/05/2016	19/05/2016	19/05/2016	19/05/2016	19/05/2016	19/05/2016	19/05/2016	20/05/2016	18/05/2016	12/08/2016	12/08/2016	12/08/2016	12/08/2016	18/05/2016	17/05/2016	17/05/2016	20/05/2016	20/05/2016	20/05/2016	17/05/2016	17/05/2016
		Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Sample ID					A2_TP10_0.0	A2_TP10_0.5	A2_TP11_0.0	A2_TP11_2.0	A2_TP12_0.0	A2_TP12_0.5	A2_TP13_0.0	A2_TP13_0.2	A2_TP14_0.3	A2_TP15_0.0	A2_TP15_0.2	A2_TP15_1.0	A2_TP16_0.3	A2_TP17_0.0	A2-TP17 N	A2-TP17 E	A2-TP17 S	A2-TP17 W	A2_TP17_2.5	A2_TP18_0.0	A2_TP18_0.3	A2_TP19_0.2	A2_TP20_0.0	A2_TP20_1.0	A2_TP21_0.0	A2_TP21_0.2
ChemName	**Units**	**EQL**																														
Metals																																
Arsenic	mg/kg	2	3000 [1]	160 [4]		*500 [6] / 20 [12]*	5.5	5.4	3.4	4.5	8.9	10	10	7.9	5.7	7.4	-	5.4	10	9.4	-	-	-	-	3.4	3.9	-	3.1	5.2	4.7	4.1	4.4
Cadmium	mg/kg	0.4	900 [1]	3 [8]		*100 [6] / 3 [12]*	<0.4	<0.4	1.5	<0.4	0.5	<0.4	<0.4	<0.4	0.8	<0.4	-	<0.4	<0.4	0.5	-	-	-	-	<0.4	<0.4	-	<0.4	0.4	<0.4	<0.4	<0.4
Chromium (III+VI)	mg/kg	5	3600 [1]	666.6 [9]		*600,000 [6] / 50 [12]*	12	15	9.9	5.1	19	11	25	12	24	13	-	12	9.2	18	-	-	-	-	6.6	10	-	5.5	30	15	11	17
Copper	mg/kg	5	240,000 [1]	315 [9]		*5000 [6] / 60 [12]*	10	6.6	11	9.1	13	<5	13	10	25	14	-	10	<5	11	-	-	-	-	15	7.7	-	<5	17	11	5.6	5.8
Lead	mg/kg	5	1500 [1]	1815 [9]		*1500 [6] / 300 [12]*	30	9.3	44	5.4	760	710	*910*	*540*	32	*710*	-	12	51	61	-	-	-	-	15	23	-	10	54	11	17	7.9
Mercury	mg/kg	0.05	730 [1]	1 [8]		*75 [6] / 1 [12]*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	-	-	-	-	<0.05	0.07	-	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	mg/kg	5	6000 [1]	465 [9]		*3000 [6] / 60 [12]*	<5	<5	6.9	<5	11	<5	12	5.6	36	11	-	5.3	<5	6	-	-	-	-	<5	5.4	-	<5	24	9	<5	<5
Zinc	mg/kg	5	400,000 [1]	1114 [9]		*35,000 [6] / 200 [12]*	26	<5	43	7.2	23	12	30	24	35	22	-	<5	7.9	49	-	-	-	-	14	33	-	<5	50	15	13	5.6
Organochlorine Pesticides (OCPs)																																
4,4-DDE	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
a-BHC	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Aldrin	mg/kg	0.05				*50 [6] / 0.05 [12]*	<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Aldrin + Dieldrin	mg/kg		45 [1]			*20 [6]*	<0.1	-	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	<0.1	-	<0.1	-
b-BHC	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
chlordane	mg/kg	0.1	530 [1]			*250 [6]*	<0.1	-	<0.1	-	<0.1	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	-	<0.1	-	-	<0.1	-	<0.1	-
d-BHC	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
DDD	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
DDT	mg/kg	0.05		640 [4]		*1000 [6] / 0.97 [12]*	<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
DDT+DDE+DDD	mg/kg		3600 [1]				<0.15	-	<0.15	-	<0.15	-	<0.15	-	-	<0.15	-	-	-	<0.15	-	-	-	-	-	<0.15	-	-	<0.15	-	<0.15	-
Dieldrin	mg/kg	0.05				*20 [6] / 0.2 [12]*	<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Endosulfan I	mg/kg	0.05	2000 [1]				<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Endosulfan II	mg/kg	0.05	2000 [1]				<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Endosulfan sulphate	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Endrin	mg/kg	0.05	100 [1]				<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Endrin aldehyde	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Endrin ketone	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
g-BHC (Lindane)	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Heptachlor	mg/kg	0.05	50 [1]			*50 [6]*	<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Heptachlor epoxide	mg/kg	0.05					<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Hexachlorobenzene	mg/kg	0.05	80 [1]				<0.05	-	<0.05	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	-	<0.05	-	-	<0.05	-	<0.05	-
Methoxychlor	mg/kg	0.05	2500 [1]				<0.2	-	<0.2	-	<0.2	-	<0.2	-	-	<0.2	-	-	-	<0.2	-	-	-	-	-	<0.2	-	-	<0.2	-	<0.2	-
Toxaphene	mg/kg	1	160 [1]				<1	-	<1	-	<1	-	<1	-	-	<1	-	-	-	<1	-	-	-	-	-	<1	-	-	<1	-	<1	-
Polycyclic Aromatic Hydrocarbons (PAHs)																																
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.9	0.7	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.8	0.6	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	0.8	0.8	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		0.7 [5]		*5 [6]*	0.7	<0.5	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	2.7	2.4	-	<0.5	<0.5	0.7	-	-	-	-	<0.5	<0.5	-	<0.5	1.4	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5					0.7	<0.5	<0.5	<0.5	3	<0.5	<0.5	<0.5	4.1	3.6	-	<0.5	<0.5	0.8	-	-	-	-	<0.5	<0.5	-	<0.5	1.8	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5					1.1	0.6	0.6	0.6	3.2	0.6	0.6	0.6	4.1	3.6	-	0.6	0.6	1.1	-	-	-	-	0.6	0.6	-	0.6	2	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	40 [1]				1.4	1.2	1.2	1.2	3.5	1.2	1.2	1.2	4.1	3.6	-	1.2	1.2	1.4	-	-	-	-	1.2	1.2	-	1.2	2.3	1.2	1.2	1.2
Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	1.9	1.6	-	<0.5	<0.5	0.6	-	-	-	-	<0.5	<0.5	-	<0.5	1.2	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					0.6	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	3	2.6	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	1.6	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	2.3	1.8	-	<0.5	<0.5	0.6	-	-	-	-	<0.5	<0.5	-	<0.5	1	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	1	1	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	0.6	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.6	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5					1.4	<0.5	<0.5	<0.5	1.8	<0.5	<0.5	<0.5	1.2	1.6	-	<0.5	<0.5	2	-	-	-	-	<0.5	<0.5	-	<0.5	0.8	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	2	1.8	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	1	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5	11,000 [3]	370 [4]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	0.5	4000 [1]			*100 [6] / 5 [12]*	4.8	<0.5	<0.5	<0.5	16.7	<0.5	<0.5	<0.5	18.7	17	-	<0.5	<0.5	7	-	-	-	-	<0.5	<0.5	-	<0.5	9.4	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5					0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	1.2	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5					1.4	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	1.4	1.5	-	<0.5	<0.5	1.9	-	-	-	-	<0.5	<0.5	-	<0.5	0.8	<0.5	<0.5	<0.5
Polychlorinated Biphenyls (PCBs)																																
Arochlor 1016	mg/kg	0.1					<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arochlor 1232	mg/kg	0.1					<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
Arochlor 1242	mg/kg	0.1					<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
Arochlor 1248	mg/kg	0.1					<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
Arochlor 1254	mg/kg	0.1					<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
Arochlor 1260	mg/kg	0.1					<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
PCBs (Sum of total)	mg/kg	0.1				*1 [12]*	<0.5	-	<0.5	-	<0.5	-	<0.5	-	-	<0.5	-	-	-	<0.5	-	-	-	-	-	<0.5	-	-	<0.5	-	<0.5	-
TRH - Semivolatile Fraction																																
C10-C16	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	-	-	-	-	<50	<50	-	<50	<50	<50	<50	<50
C16-C34	mg/kg	100	27,000 [3]	2500 [5]	**5000 [7]**		<100	<100	<100	<100	770	240	<100	<100	700	520	-	<100	<100	<100	-	-	-	-	<100	140	-	<100	260	<100	<100	<100
C34-C40	mg/kg	100	38,000 [3]	6600 [5]	**10,000 [7]**		<100	<100	<100	<100	880	140	<100	<100	510	150	-	<100	<100	<100	-	-	-	-	<100	<100	-	<100	130	<100	<100	<100
F2-NAPHTHALENE	mg/kg	50	20,000 [3]	170 [5]	**1000 [7]**		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	-	-	-	-	<50	<50	-	<50	<50	<50	<50	<50
C10 - C14	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	-	-	-	-	<20	<20	-	<20	<20	<20	<20	<20
C15 - C28	mg/kg	50					<50	<50	<50	<50	240	<50	<50	<50	290	69	-	<50	<50	<50	-	-	-	-	<50	60	-	<50	75	<50	<50	<50
C29-C36	mg/kg	50					<50	<50	<50	<50	890	220	64	<50	640	600	-	<50	76	<50	-	-	-	-	<50	96	-	62	240	<50	<50	<50
+C10 - C36 (Sum of total)	mg/kg	50				*1,000 [12]*	<50	<50	<50	<50	*1130*	220	64	<50	930	669	-	<50	76	<50	-	-	-	-	<50	156	-	62	315	<50	<50	<50
TRH / BTEX																																
Benzene	mg/kg	0.1	4 [2]	95 [5]		*1 [6] / 0.5 [12]*	<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
Ethylbenzene	mg/kg	0.1	27,000 [3]	185 [5]		*50 [6] / 5 [12]*	<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
Naphthalene	mg/kg	0.5	11,000 [3]	370 [4]			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	-	-	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.1	99,000 [3]	135 [5]		*130 [6] / 3 [12]*	<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
Xylene (m & p)	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	-	-	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene (o)	mg/kg	0.1					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	-	-	-	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1
Xylene Total	mg/kg	0.3	81,000 [3]	95 [5]		*25 [6] / 5 [12]*	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	-	-	-	-	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3
C6 - C9	mg/kg	20				*800 [6] / 100 [12]*	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	-	-	-	-	<20	<20	-	<20	<20	<20	<20	<20
C6-C10 less BTEX (F1)	mg/kg	20	310 [2]	215 [5]	**800 [7]**		<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	-	-	-	-	<20	<20	-	<20	<20	<20	<20	<20
C6-C10	mg/kg	20					<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	-	-	-	-	<20	<20	-	<20	<20	<20	<20	<20
Perfluorinated Compounds (PFCs)																																
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.01	900 [10]				<0.01	-	<0.01	-	<0.01	-	<0.01	-	-	<0.01	-	-	-	<0.01	-	-	-	-	-	<0.01	-	-	<0.01	-	<0.01	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.005	90 [10]	4.71 [10]			<0.005	-	0.01	-	<0.005	-	<0.005	-	-	0.006	-	-	-	<0.005	-	-	-	-	-	0.005	-	-	0.013	-	<0.005	-
Perfluorooctanoate	mg/kg	0.005	240 [10]	3.73 [10]			<0.005	-	<0.005	-	<0.005	-	<0.005	-	-	<0.005	-	-	-	<0.005	-	-	-	-	-	<0.005	-	-	<0.005	-	<0.005	-
Asbestos																																
Asbestos from ACM in Soil	%w/w		0.05 [11]				0	-	0	-	0	-	-	0	-	-	0	-	-	0	<0.01	<0.01	<0.01	<0.01	-	-	0	-	0	-	-	0
Asbestos from FA & AF in Soil	%w/w	0.001	0.001 [11]				<0.001	-	<0.001	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	0.0002	0.0014	<0.001	<0.001	<0.001	-	-	<0.001	-	<0.001	-	-	<0.001
Mass ACM	g						0	-	0	-	0	-	-	0	-	-	0	-	-	0	0	0	0	0	-	-	0	-	0	-	-	0
Mass AF	g						0	-	0	-	0	-	-	0	-	-	0	-	-	0.0025	0.0196	0	0	0	-	-	0	-	0	-	-	0
Mass FA	g						0	-	0	-	0	-	-	0	-	-	0	-	-	0					-	-	0	-	0	-	-	0
Asbestos Fibres							ND	-	ND	-	ND	-	-	ND	-	-	ND	-	-	ND	ND	ND	ND	ND	-	-	ND	-	ND	-	-	ND
% Clay	%	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					14	19	18	19	8.8	7.6	15	13	6.2	14	-	25	4	7.2	-	-	-	-	21	14	-	9.9	10	22	13	10
pH (Lab)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.2	-	-	-	-	-	-	-

Notes:

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct

[4] NEPC (2013) Generic calculated EIL from Table 1B(5) Commercial and Industrial.

[5] NEPC (2013) Table 1 B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial

[6] Airports (Environment Protection) Regulations 1997

[7] NEPC (2013) Table 1B(7) Management Limits for TPH fractions F1 - F4 in soil - Commercial and Industrial

[8] NEPM 1999 generated EILs (no EIL provided in NEPC 2013)

[9] EILs derived from NEPM 2013 equation ABC+ACL.

[10] GHD (2015) Table 1 Interim Screening Levels (ISLs), Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework

[11] WA DOH (2009) Soil asbestos investigation criteria

[12] Airports (Environment Protection) Regulations 1997 - Table 2 Areas of environmental significance

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

Table A - Soil Analytical Results

		Reference	NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil	NEPM Table 1B(6) ESLs Commercial and Industrial	**NEPM 2013 Table 1B(7) Management Limits for TPH fractions in soil**	*Airport Regulations*	501183	501183	501183	501183	501183	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799	502799
		Sample date					16/05/2016	16/05/2016	16/05/2016	16/05/2016	16/05/2016	30/05/2016	30/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	31/05/2016	1/06/2016	1/06/2016	1/06/2016	1/06/2016	1/06/2016
		Matrix					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		Sample ID					A2_TP22_0.0	A2_TP22_0.2	A2_TP22_0.5	A2_TP23_0.0	A2_TP23_0.2	A2_TP24_0.0	A2_TP24_0.5	A2_TP25_0.3	A2_TP26_0.0	A2_TP26_1.0	A2_TP27_0.0	A2_TP28_0.3	A2_TP29_0.0	A2_TP29_0.5	A2_TP30_0.2	A2_TP31_0.0	A2_TP32_0.0	A2_TP33_0.0	A2_TP33_0.5	A2_TP34_0.0	A2_TP34_0.3	A2_TP35_0.0	A2_TP35_0.2	A2_TP35_1.0
ChemName	**Units**	**EQL**																												
Metals																														
Arsenic	mg/kg	2	3000[1]	160[4]		*500[6] / 20[12]*	7.6	-	4.7	3.5	3.8	<2	2.3	2.2	6.3	5.2	2.3	4	2.3	<2	2.8	2.2	7.6	<2	4.6	<2	3.3	<2	-	<2
Cadmium	mg/kg	0.4	900[1]	3[8]		*100[6] / 3[12]*	0.8	-	<0.4	<0.4	<0.4	<0.4	0.5	<0.4	0.6	<0.4	0.9	<0.4	<0.4	0.5	<0.4	<0.4	<0.4	0.6	<0.4	<0.4	<0.4	<0.4	-	<0.4
Chromium (III+VI)	mg/kg	5	3600[1]	666.6[9]		*600,000[6] / 50[12]*	13	-	16	9.1	11	10	20	9.3	13	18	10	14	15	25	13	13	15	22	29	14	15	16	-	11
Copper	mg/kg	5	240,000[1]	315[9]		*5000[6] / 60[12]*	9.1	-	7.1	15	6	<5	5.9	<5	17	11	10	6.3	17	11	5.9	10	10	46	11	9.6	10	20	-	11
Lead	mg/kg	5	1500[1]	1815[9]		*1500[6] / 300[12]*	35	-	8.8	41	16	8.8	5.1	12	24	13	110	16	91	6.7	9	12	*2200*	20	14	11	24	36	-	7.9
Mercury	mg/kg	0.05	730[1]	1[8]		*75[6] / 1[12]*	<0.05	-	<0.05	0.1	<0.05	<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
Nickel	mg/kg	5	6000[1]	465[9]		*3000[6] / 60[12]*	5.6	-	<5	6.7	<5	<5	<5	<5	7.8	<5	5.7	<5	<5	7.2	<5	7.9	5.5	*110*	5.4	6.1	<5	10	-	<5
Zinc	mg/kg	5	400,000[1]	1114[9]		*35,000[6] / 200[12]*	23	-	<5	38	12	<5	<5	<5	39	6.4	25	11	57	9.5	8.9	18	25	44	7.1	15	20	35	-	5.3
Organochlorine Pesticides (OCPs)																														
4,4-DDE	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
a-BHC	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Aldrin	mg/kg	0.05				*50[6] / 0.05[12]*	<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Aldrin + Dieldrin	mg/kg		45[1]			*20[6]*	<0.1	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
b-BHC	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
chlordane	mg/kg	0.1	530[1]			*250[6]*	<0.1	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
d-BHC	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
DDD	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
DDT	mg/kg	0.05		640[4]		*1000[6] / 0.97[12]*	<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
DDT+DDE+DDD	mg/kg		3600[1]				<0.15	-	-	<0.15	-	<0.15	-	-	<0.15	-	-	-	<0.15	-	-	-	-	<0.15	-	<0.15	-	<0.15	-	-
Dieldrin	mg/kg	0.05				*20[6] / 0.2[12]*	<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Endosulfan I	mg/kg	0.05	2000[1]				<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Endosulfan II	mg/kg	0.05	2000[1]				<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Endosulfan sulphate	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Endrin	mg/kg	0.05	100[1]				<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Endrin aldehyde	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Endrin ketone	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
g-BHC (Lindane)	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Heptachlor	mg/kg	0.05	50[1]			*50[6]*	<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Heptachlor epoxide	mg/kg	0.05					<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Hexachlorobenzene	mg/kg	0.05	80[1]				<0.05	-	-	<0.05	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Methoxychlor	mg/kg	0.05	2500[1]				<0.2	-	-	<0.2	-	<0.05	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	<0.05	-	<0.05	-	-
Toxaphene	mg/kg	1	160[1]				<1	-	-	<1	-	<1	-	-	<1	-	-	-	<1	-	-	-	-	<1	-	<1	-	<1	-	-
Polycyclic Aromatic Hydrocarbons (PAHs)																														
Acenaphthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Anthracene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(a) pyrene	mg/kg	0.5		0.7[5]		*5[6]*	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5					0.6	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	40[1]				1.2	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2
Benzo[b+j]fluoranthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Chrysene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Fluoranthene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Fluorene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
PAHs (Sum of total)	mg/kg	0.5	4000[1]			*100[6] / 5[12]*	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Phenanthrene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Pyrene	mg/kg	0.5					<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Polychlorinated Biphenyls (PCBs)																														
Arochlor 1016	mg/kg	0.1					<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Arochlor 1221	mg/kg	0.1					-	-	-	-	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Arochlor 1232	mg/kg	0.1					<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Arochlor 1242	mg/kg	0.1					<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Arochlor 1248	mg/kg	0.1					<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Arochlor 1254	mg/kg	0.1					<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
Arochlor 1260	mg/kg	0.1					<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
PCBs (Sum of total)	mg/kg	0.1				*1[12]*	<0.5	-	-	<0.5	-	<0.1	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	<0.1	-	<0.1	-	-
TRH - Semivolatile Fraction																														
C10-C16	mg/kg	50					<50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50
C16-C34	mg/kg	100	27,000[3]	2500[5]	**5000[7]**		<100	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	<100
C34-C40	mg/kg	100	38,000[3]	6600[5]	**10,000[7]**		<100	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	<100
F2-NAPHTHALENE	mg/kg	50	20,000[3]	170[5]	**1000[7]**		<50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50
C10 - C14	mg/kg	20					<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20
C15 - C28	mg/kg	50					<50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	-	<50
C29-C36	mg/kg	50					<50	-	<50	79	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50
+C10 - C36 (Sum of total)	mg/kg	50				*1,000[12]*	<50	-	<50	79	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	-	<50
TRH / BTEX																														
Benzene	mg/kg	0.1	4[2]	95[5]		*1[6] / 0.5[12]*	<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	<0.1	-	<0.1
Ethylbenzene	mg/kg	0.1	27,000[3]	185[5]		*50[6] / 5[12]*	<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	<0.1	-	<0.1
Naphthalene	mg/kg	0.5	11,000[3]	370[4]			<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5
Toluene	mg/kg	0.1	99,000[3]	135[5]		*130[6] / 3[12]*	<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	<0.1	-	<0.1
Xylene (m & p)	mg/kg	0.2					<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2
Xylene (o)	mg/kg	0.1					<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1
Xylene Total	mg/kg	0.3	81,000[3]	95[5]		*25[6] / 5[12]*	<0.3	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	-	<0.3
C6 - C9	mg/kg	20				*800[6] / 100[12]*	<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20
C6-C10 less BTEX (F1)	mg/kg	20	310[2]	215[5]	**800[7]**		<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20
C6-C10	mg/kg	20					<20	-	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20
Perfluorinated Compounds (PFCs)																														
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.01	900[10]				<0.01	-	-	<0.01	-	<0.01	-	-	<0.01	-	-	-	<0.01	-	-	-	-	<0.01	-	<0.01	-	<0.01	-	-
Perfluorooctanesulfonic acid (PFOS)	mg/kg	0.005	90[10]	4.71[10]			0.006	-	-	<0.005	-	0.035	-	-	<0.005	-	-	-	<0.005	-	-	-	-	<0.005	-	0.02	-	0.028	-	-
Perfluorooctanoate	mg/kg	0.005	240[10]	3.73[10]			<0.005	-	-	<0.005	-	<0.005	-	-	<0.005	-	-	-	<0.005	-	-	-	-	<0.005	-	<0.005	-	<0.005	-	-
Asbestos																														
Asbestos from ACM in Soil	%w/w		0.05[11]				-	0	-	-	0	0	-	-	0	-	-	-	0	-	-	-	-	0	-	0	-	-	0	-
Asbestos from FA & AF in Soil	%w/w	0.001	0.001[11]				-	<0.001	-	-	<0.001	<0.001	-	-	<0.001	-	-	-	<0.001	-	-	-	-	<0.001	-	<0.001	-	-	<0.001	-
Mass ACM	g						-	0	-	-	0	0	-	-	0	-	-	-	0	-	-	-	-	0	-	0	-	-	0	-
Mass AF	g						-	0	-	-	0	0	-	-	0	-	-	-	0	-	-	-	-	0	-	0	-	-	0	-
Mass FA	g						-	0	-	-	0	0	-	-	0	-	-	-	0	-	-	-	-	0	-	0	-	-	0	-
Asbestos Fibres							-	ND	-	-	ND	ND	-	-	ND	-	-	-	ND	-	-	-	-	ND	-	ND	-	-	ND	-
% Clay	%	1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Moisture Content (dried @ 103°C)	%	1					20	-	22	15	17	5.9	15	7.8	8.9	16	6.2	7.4	7.5	19	6.9	9.8	8	10	21	9.3	9.4	9.7	-	18
pH (Lab)	pH_Units	0.1					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

[1] NEPC (2013) Table 1 A(1) Health investigations levels for soil contaminants – Commercial / Industrial D.

[2] NEPC (2013) Table 1 A(3) Soil HSLs for vapour intrusion – commercial/industrial, 0 to <1, 1 - <2, 2 - <4, >4 m CLAY.

[3] HSL-D Commercial / Industrial Criteria and Intrusive Maintenance Workers detailed within Table A4, Friebel, E & Nadebaum, P 2011, Soil Health screening levels for direct

[4] NEPC (2013) Generic calculated EIL from Table 1B(5) Commercial and Industrial.

[5] NEPC (2013) Table 1 B(6) ESLs for TPH fractions F1-F4, BTEX and benzo(a)pyrene in soil – Commercial and Industrial

[6] Airports (Environment Protection) Regulations 1997

[7] NEPC (2013) Table 1B(7) Management Limits for TPH fractions F1 - F4 in soil - Commercial and Industrial

[8] NEPM 1999 generated EILs (no EIL provided in NEPC 2013)

[9] EILs derived from NEPM 2013 equation ABC+ACL.

[10] GHD (2015) Table 1 Interim Screening Levels (ISLs), Managing PFC contamination at Airports, Interim Management Strategy and Decision Framework

[11] WA DOH (2009) Soil asbestos investigation criteria

[12] Airports (Environment Protection) Regulations 1997 - Table 2 Areas of environmental significance

NL – NL indicates the HSL is not limiting (see Footnote 5, Table 1A(3)).

TEQ – Toxic Equivalent.

Table B - Groundwater Analytical Results

	Reference		**GIL**	**HSLs**	*Airport Regulations*	505196	505196	505196
	Matrix					Water	Water	Water
	Date Sampled					20/06/2016	20/06/2016	21/06/2016
	Borehole ID					A2-GW1	A2-GW2	A2-GW3
ChemName	**Units**	**EQL**						
Dissolved Metals								
Arsenic (Filtered)	µg/L	1	24 [1]		*50* [7]	1	<1	2
Cadmium (Filtered)	µg/L	0.1	0.7 [12]		*2.0* [7]	<0.1	0.3	0.2
Chromium (III+VI) (Filtered)	µg/L	1	4.4 [13]		*50* [7]	3	<1	<1
Copper (Filtered)	µg/L	1	1.3 [13]		*5.0* [7]	<1	<1	*14*
Lead (Filtered)	µg/L	1	4.4 [13]		*5.0* [7]	<1	<1	*18*
Mercury (Filtered)	µg/L	0.1	0.1 [12]		*0.1* [7]	0.1	<0.1	<0.1
Nickel (Filtered)	µg/L	1	7 [12]		*15* [7]	3	*34*	*210*
Zinc (Filtered)	µg/L	5	15 [13]		*50* [7]	<5	44	*170*
Perfluorinated Compounds (PFCs)								
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	5 [9]			<0.05	<0.05	<0.05
Perfluorooctanoate (PFOA)	µg/L	0.01	0.4 [9]			<0.01	<0.01	<0.01
PFOS	µg/L	0.01	0.2 [9]			0.04	0.01	<0.01
Polycyclic Aromatic Hydrocarbons (PAHs)								
Acenaphthene	µg/L	0.01				<0.01	<0.01	<0.01
Acenaphthylene	µg/L	0.01				<0.01	<0.01	<0.01
Anthracene	µg/L	0.01				<0.01	<0.01	<0.01
Benz(a)anthracene	µg/L	0.01				<0.01	<0.01	<0.01
Benzo(a) pyrene	µg/L	0.01	0.01 [5]			<0.01	<0.01	<0.01
Benzo[b+j]fluoranthene	mg/L	0.00001				<0.00001	<0.00001	<0.00001
Benzo(g,h,i)perylene	µg/L	0.01				<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.01				<0.01	<0.01	<0.01
Chrysene	µg/L	0.01				<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/L	0.01				<0.01	<0.01	<0.01
Fluoranthene	µg/L	0.01				<0.01	<0.01	<0.01
Fluorene	µg/L	0.01				<0.01	<0.01	<0.01
Indeno(1,2,3-c,d)pyrene	µg/L	0.01				<0.01	<0.01	<0.01
Naphthalene	µg/L	0.01	50 [12]			<0.01	<0.01	<0.01
PAHs (Sum of total)	µg/L	0.01				<0.05	<0.05	<0.05
Phenanthrene	µg/L	0.01				<0.01	<0.01	<0.01
Pyrene	µg/L	0.01				<0.01	<0.01	<0.01
TRH - Semivolatile Fraction								
C10-C16	mg/L	0.05				<0.05	<0.05	<0.05
C16-C34	mg/L	0.1				<0.1	<0.1	<0.1
C34-C40	mg/L	0.1				<0.1	<0.1	<0.1
F2-NAPHTHALENE	mg/L	0.05		**NL** [6]		<0.05	<0.05	<0.05
C10 - C14	µg/L	50				<50	<50	<50
C15 - C28	µg/L	100				<100	<100	<100
C29-C36	µg/L	100				<100	<100	<100
+C10 - C36 (Sum of total)	µg/L	100	600 [4]			<100	<100	<100
TRH Volatiles/BTEX								
Benzene	µg/L	1	500 [12]	**30,000** [6]	*300* [7]	<1	<1	<1
Ethylbenzene	µg/L	1	140 [3]	**NL** [6]		<1	<1	<1
Naphthalene	µg/L	10	50 [12]	**NL** [6]		<10	<10	<10
Toluene	µg/L	1	300 [3]	**NL** [6]		<1	<1	<1
Xylene (m & p)	µg/L	2				<2	<2	<2
Xylene (o)	µg/L	1	350 [1]			<1	<1	<1
Xylene Total	µg/L	3	380 [3]	**NL** [6]		<3	<3	<3
C6 - C9	µg/L	20	150 [4]			<20	<20	<20
C6-C10 less BTEX (F1)	mg/L	0.02		**NL** [6]		<0.02	<0.02	<0.02
C6-C10	mg/L	0.02				<0.02	<0.02	<0.02

Notes:

[1] ANZECC (2000) 95% of species protected – fresh water

[2] ANZECC (2000) 99% of species protected –fresh water

[3] NSW EPA (1994) Protection of aquatic ecosystems - fresh water

[4] Dutch (2000) groundwater intervention levels

[5] NHMRC 2011 Australian Drinking Water Guidelines

[6] NEPC (2013) Table 1 A(4) Groundwater HSLs for vapour intrusion –Commercial / Industrial, 2 to <4m, CLAY.

[7] Airports (Environment Protection) Regulations 1997 - Marine water

[8] Provisional USEPA Region 4 2009 Guideline (PFOS/PFOA) for drinking water

[9] Managing PFC Contamination at Airports, Interim Contamination Management Strategy and Decision Framework (GHD, June 2015)

[10] Aquatic predicted no-effect contentration (PNEC) for Perfluorooctane sulfonic acid, Qi et al 2011

[11] Ecological toxicity criterion for PFOA, Giesy et al 2010

[12] ANZECC (2000) 99% of species protected –marine

[13] ANZECC (2000) 95% of species protected – marine

Table C - Soil OA/OC

		Lab Reference	501564	501564	**RPD**	501564	ES1611169	**RPD**	501564	501564	**RPD**	501564	ES1611169	**RPD**	502799	502799	**RPD**	502799	EM1606431	**RPD**	502799	502799	**RPD**	502799	EM1606431	**RPD**
		Sample ID	A2_TP01_0.0	A2-QC01		A2_TP01_0.0	A2-QC02		A2_TP19_0.2	A2-QC03		A2_TP19_0.2	A2-QC04		A2_TP25_0.3	A2-QC05		A2_TP25_0.3	A2-QC06		A2_TP31_0.0	A2-QC07		A2_TP31_0.0	A2-QC08	
		Date Sampled	19/05/2016	19/05/2016		19/05/2016	19/05/2016		20/05/2016	20/05/2016		20/05/2016	20/05/2016		31/05/2016	31/05/2016		31/05/2016	31/05/2016		31/05/2016	31/05/2016		31/05/2016	31/05/2016	
	Units	**EQL**																								
Heavy Metals																										
Arsenic	mg/kg	2 (Primary): 5 (Interlab)	5.8	5.1	13	5.8	<5.0	15	3.1	3.7	18	3.1	<5.0	0	2.2	4.1	60	2.2	5.0	78	2.2	<2.0	10	2.2	<5.0	0
Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<0.4	0	<0.4	<1.0	0	<0.4	<0.4	0	<0.4	<1.0	0
Chromium (III+VI)	mg/kg	5 (Primary): 2 (Interlab)	**50.0**	**9.9**	**134**	**50.0**	**9.0**	**139**	5.5	6.6	18	5.5	6.0	9	9.3	10.0	7	9.3	11.0	17	13.0	6.3	69	13.0	10.0	26
Copper	mg/kg	5	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	10.0	12.0	18	10.0	12.0	18
Lead	mg/kg	5	42.0	35.0	18	**42.0**	**183.0**	**125**	10.0	14.0	33	10.0	10.0	0	12.0	14.0	15	12.0	13.0	8	12.0	5.5	74	12.0	15.0	22
Mercury	mg/kg	0.1	<0.05	<0.05	0	<0.05	<0.1	0	<0.05	<0.05	0	<0.05	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	mg/kg	5 (Primary): 2 (Interlab)	**18.0**	**<5.0**	**113**	**18.0**	**<2.0**	**160**	<5.0	<5.0	0	<5.0	<2.0	0	<5.0	<5.0	0	<5.0	<2.0	0	7.9	9.2	15	7.9	8.0	1
Zinc	mg/kg	5	**64.0**	**7.4**	**159**	**64.0**	**<5.0**	**171**	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	5.5	10	<5.0	<5.0	0	18.0	14.0	25	18.0	18.0	0
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a) pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0
Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0
Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
PAHs (Sum of total)	mg/kg	0.5	<0.5	<0.5	0	<0.5	-	-	<0.5	<0.5	0	<0.5	-	-	<0.5	<0.5	0	<0.5	-	-	<0.5	<0.5	0	<0.5	-	-
Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
TRH / BTEX																										
Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0	<0.1	<0.1	0	<0.1	<0.2	0
Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Naphthalene	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0	<0.2	<0.2	0	<0.2	<0.5	0
Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0	<0.1	<0.1	0	<0.1	<0.5	0
Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0	<0.3	<0.3	0	<0.3	<0.5	0
C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
C6-C10 less BTEX (F1)	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
C6-C10	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0	<20.0	<20.0	0	<20.0	<10.0	0
TRH - Semivolatile Fraction																										
C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	110.0	10	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0
F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0
C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0	<20.0	<20.0	0	<20.0	<50.0	0
C15 - C28	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0
C29-C36	mg/kg	50 (Primary): 100 (Interlab)	<50.0	<50.0	0	<50.0	<100.0	0	62.0	84.0	30	62.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<50.0	0	<50.0	<100.0	0
+C10 - C36 (Sum of total)	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	62.0	84.0	30	62.0	<50.0	21	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0

Notes:

The acceptable range depends upon the levels detected:

0 – 100% RPD (When the average concentration is < 5 times the LOR)	🟩
0 – 75% RPD (When the average concentration is 5 to 10 times the LOR)	🟦
0 – 50% RPD (When the average concentration is > 10 times the LOR)	🟧

Table D - Groundwater QA/QC

		Lab Reference	505196	505196	**RPD**
		Sample ID	A2-GW3	A2-QC09	
		Date Sampled	21/06/2016	21/06/2016	
	Units	**EQL**			
Dissolved Metals					
Arsenic (Filtered)	mg/l	0.001	0.002	0.002	0
Cadmium (Filtered)	mg/l	0.0001	0.0002	0.0002	0
Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0
Copper (Filtered)	mg/l	0.001	0.014	0.013	7
Lead (Filtered)	mg/l	0.001	0.018	0.017	6
Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
Nickel (Filtered)	mg/l	0.001	0.21	0.2	5
Zinc (Filtered)	mg/l	0.005	0.17	0.17	0
Perfluorinated Compounds (PFCs)					
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/l	0.00005	<0.00005	<0.00005	0
Perfluorooctanoate	mg/l	0.00001	<0.00001	<0.00001	0
PFOS	mg/l	0.00001	<0.00001	<0.00001	0
Polycyclic Aromatic Hydrocarbons (PAHs)					
Acenaphthene	mg/l	0.00001	<0.00001	<0.00001	0
Acenaphthylene	mg/l	0.00001	<0.00001	<0.00001	0
Anthracene	mg/l	0.00001	<0.00001	<0.00001	0
Benz(a)anthracene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo(a) pyrene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo[b+j]fluoranthene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo(g,h,i)perylene	mg/l	0.00001	<0.00001	<0.00001	0
Benzo(k)fluoranthene	mg/l	0.00001	<0.00001	<0.00001	0
Chrysene	mg/l	0.00001	<0.00001	<0.00001	0
Dibenz(a,h)anthracene	mg/l	0.00001	<0.00001	<0.00001	0
Fluoranthene	mg/l	0.00001	<0.00001	<0.00001	0
Fluorene	mg/l	0.00001	<0.00001	<0.00001	0
Indeno(1,2,3-c,d)pyrene	mg/l	0.00001	<0.00001	<0.00001	0
Naphthalene	mg/l	0.00001	<0.00001	<0.00001	0
PAHs (Sum of total)	mg/l	0.00005	<0.00005	<0.00005	0
Phenanthrene	mg/l	0.00001	<0.00001	<0.00001	0
Pyrene	mg/l	0.00001	<0.00001	<0.00001	0
TRH / BTEX					
Benzene	µg/l	1	<1.0	<1.0	0
Ethylbenzene	µg/l	1	<1.0	<1.0	0
Naphthalene	µg/l	10	<10.0	<10.0	0
Toluene	µg/l	1	<1.0	<1.0	0
Xylene (m & p)	µg/l	2	<2.0	<2.0	0
Xylene (o)	µg/l	1	<1.0	<1.0	0
Xylene Total	µg/l	3	<3.0	<3.0	0
C6 - C9	µg/l	20	<20.0	<20.0	0
C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	0
C6-C10	mg/l	0.02	<0.02	<0.02	0
TRH - Semivolatile Fraction					
C10-C16	mg/l	0.05	<0.05	<0.05	0
C16-C34	mg/l	0.1	<0.1	<0.1	0
C34-C40	mg/l	0.1	<0.1	<0.1	0
F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
C10 - C14	µg/l	50	<50.0	<50.0	0
C15 - C28	µg/l	100	<100.0	<100.0	0
C29-C36	µg/l	100	<100.0	<100.0	0
+C10 - C36 (Sum of total)	µg/l	100	<100.0	<100.0	0

Notes:

The acceptable range depends upon the levels detected:

0 – 100% RPD (When the average concentration is < 5 times the LOR)	🟩
0 – 75% RPD (When the average concentration is 5 to 10 times the LOR)	🟦
0 – 50% RPD (When the average concentration is > 10 times the LOR)	🟧

Appendix A – NEPM 2013 Ecological Investigation Limits Methodology

Jacobs Group (Australia) Pty Limited
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NEPM 2013 Ecological Investigation Limits Methodology

Ecological investigation levels (EILs) for the protection of terrestrial ecosystems have been derived for common contaminants in soil based on a species sensitivity distribution (SSD) model developed for Australian conditions. EILs have been derived for As, Cu, CrIII, DDT, naphthalene, Ni, Pb and Zn.

EILs apply principally to contaminants in the top 2 metres of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species. In arid regions, where the predominant species may have greater root penetration, specific considerations may result in their application to 3 metres depth.

The methodology assumes that the ecosystem is adapted to the ambient background concentration (ABC) for the locality and that it is only adding contaminants over and above this background concentration which has an adverse effect on the environment.

The ABC of a contaminant is the soil concentration in a specified locality that is the sum of the naturally occurring background level and the contaminant levels that have been introduced from diffuse or non-point sources by general anthropogenic activity not attributed to industrial, commercial, or agricultural activities, for example, motor vehicle emissions.

The preferred method to determine the ABC is to measure the ABC at an appropriate reference site. This approach is essential in areas where there is a high naturally occurring background level such as will occur in mineralised areas.

An added contaminant limit (ACL) is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required. **The EIL is derived by summing the ACL and the ABC.**

ACLs are based on the soil characteristics of pH, CEC and clay content. Empirical relationships that can model the effect of these soil properties on toxicity are used to develop soil-specific values. These soil-specific values take into account the biological availability of the element in various soils. In this approach different soils will have different contaminant EILs rather than a single generic EIL for each contaminant.

The adopted soil characteristics (pH, clay content and cation exchange capacity) have been selected from sample A2_TP17_2.5 as the sample was considered to be representative of the primary soil type (silty clay) at the site and that the soils are unlikely to be impacted by anthropogenic sources due to the sample depth (2.4 m bgl).

Table 5.2: Calculating the ACL

ACLs	mg/kg								
	A2_TP17_2.5	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
pH	7.2								
CEC	16				300			460	1100
% clay	58			660					
Generic	-					1800			

Information derived from **Table 1B(1)** *Soil-specific added contaminant limits for aged zinc in soils*, **Table 1B(2)** *Soil-specific added contaminant limits for aged copper in soils*, **Table 1B(3)** *Soil-specific added contaminant limits for aged chromium III and nickel in soils*, and **Table 1B(4)** *Generic added contaminant limits for lead in soils (commercial/industrial) irrespective of their physicochemical properties (NEPM 2013)*.

Table 5.3: Calculating the ABC

ABC	mg/kg							
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
A2_TP17_2.5	n/a	n/a	6.6	15	15	n/a	5	14

Sample A2_TP17_2.5 (silty clay) was assumed to be representative of the ôbackground concentrationô of the site due to the depth 2.4 m bgl, and that the clays at that depth are unlikely to be impacted by anthropogenic sources.

The EIL is derived by summing the ACL and the ABC.

Table 5.4: Calculating the EIL

EILs	mg/kg									
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	DDT	Naphth.
ABC + ACL			666.6[3]	315[3]	1815[3]		465[3]	1114[3]		
NEPM 2013	160[1]								640[1]	370[1]
NEPM 1999		3[2]				1[2]				

[1] Generic EILs for aged arsenic, DDT and Naphthalene from **Table 1B(5)** for commercial/industrial land use**.**

[2] EILs from NEPM 1999 (no EILs specified for contaminants in NEPM 2013).

[3] EILs derived from NEPM 2013 equation ABC+ACL.

Appendix B – Borehole Logs

JACOBS

BOREHOLE No. A2-TP01

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 20/05/16 - 20/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A3-TP01_0.0, A2-QC01, A2-QC02					▨	FILL: Silty CLAY: (CL) brown, dry, stiff, trace fine gravel, minor fine grained sands, minor rootlets, no odour.	St	D	
										As above but light brown and brown, some fine grained sands.	St	D	
									▧	Silty CLAY: (CL) brown mottled orange/brown, slightly moist, stiff, trace fine ironstone gravel, no odour.	St	Sl. M	
	0	A		A3-TP01_0.5									
										As above but brown mottled grey/brown and red/brown.	St	Sl. M	
	0	A		A3-TP01_1.0				1					
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP02

Project: Contamination Investigation
Location: Bankstown Airport - Site 2
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 20/05/16 - 20/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked: MS

FIELD DATA									SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP02_0.0	○					FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine gravel, minor fine to medium grained sands, minor rootlets, no odour.	St	D	
										FILL: silty Sandy CLAY: (CL) light brown and light grey, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2-TP02_0.2	○								
	0	A		A2-TP02_0.5	○					Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	
													pp (510, 480, 480)
										As above but grey mottled orange/brown and red/brown.	VSt	Sl. M	
	0	A		A2-TP02_1.0	○			1					
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
→◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP03

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 17/05/16 - 17/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP03_0.0	○				Silty CLAY: (CL) brown, dry, stiff, minor fine gravel, trace fine grained sands, minor rootlets, no odour.	St	D	
									FILL: sandy Silty CLAY: (CL) light brown and brown, dry, hard, minor fine gravel, fine grained sands, no odour.	H	D	
	0	A		A2-TP03_0.2	○							
									Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, trace fine grained sands, minor rootlets, no odour.	VSt	Sl. M	
	0	A		A2-TP03_0.5	○							
									Silty CLAY: (CL) grey mottled orange/brown and red/brown, moist, stiff, minor fine to medium grained sands, no odour.	St	M	
	0	A		A2-TP03_1.0	○		1					
									Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
							2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

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◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

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⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP04

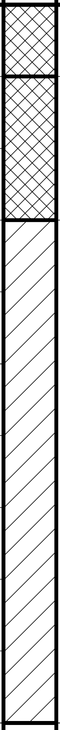
Project: Contamination Investigation
Location: Bankstown Airport - Site 2
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 17/05/16 - 17/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked: MS



	FIELD DATA								SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP04_0.0	○				FILL: Silty CLAY: (CL) brown, dry, firm, minor fine gravel, some fine to medium grained sands, no odour.	F	D	
									FILL: silty Sandy CLAY: (CL) grey/brown and brown, dry, hard, minor fine gravel, fine grained sands, no odour.	H	D	
	0	A		A2-TP04_0.2	○							
									Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	
	0	A		A2-TP04_0.5	○							pp (440, 480, 500)
									As above but brown/grey mottled orange/brown and red/brown.	VSt	Sl. M	
	0	A		A2-TP04_1.0	○							pp (460, 490, 440)
								1	Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2				

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP05

Project: Contamination Investigation
Location: Bankstown Airport - Site 2
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 17/05/16 - 17/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked: MS

	FIELD DATA							SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP05_0.0	○			FILL: Silty CLAY: (CL) brown and grey/brown, dry, firm, minor fine gravel, trace fine grained sands, minor rootlets, no odour.	F	D	
								FILL: sandy Silty CLAY: (CL) light grey/brown and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2-TP05_0.3	○						
								Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, minor medium grained sands, trace rootlets, no odour.	VSt	Sl. M	
	0	A		A2-TP05_0.5	○						pp (520, 500, 520)
	0	A		A2-TP05_0.5 - 1.0	▮			As above but grey mottled orange/brown and red/brown and stiff.	St	Sl. M	
							1				
	0	A		A2-TP05_1.0	○						pp (410, 420, 470)
								Silty CLAY: (CL) grey mottled red/brown and orange/brown, moist, firm, minor fine to medium grained sands, no odour.	F	M	
							2				
	0	A		A2-TP05_2.0	○						pp (310, 320, 350)
								As above but stiff and minor small ironstone gravel.	St	M	
	0	A		A2-TP05_2.5	○						pp (440, 460, 470)
								Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3				

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP06

Project: Contamination Investigation
Location: Bankstown Airport - Site 2
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 17/05/16 - 17/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked: MS

FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP06_0.0	○				FILL: Silty CLAY: (CL) brown, dry, firm, minor fine gravel, minor rootlets, no odour.	F	D	
									FILL: sandy Silty CLAY: (CL) light brown and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2-TP06_0.2	○							
									Silty CLAY: (CL) brown mottled orange/brown and dark brown, slightly moist, stiff, minor rootlets, no odour.	St	Sl. M	
	0	A		A2-TP06_0.5	○							pp (350, 320, 310)
									As above but grey mottled brown and orange/brown and no rootlets.	St	Sl. M	
								1				
	0	A		A2-TP06_1.0	○							pp (380, 360, 400)
									Silty CLAY: (CL) grey mottled red/brown, slightly moist, firm, trace fine grained sands, no odour.	F	Sl. M	
								2				
	0	A		A2-TP06_2.0	○							pp (260, 280, 300)
									As above	F	Sl. M	
	0	A		A2-TP06_2.5	○							pp (280, 300, 320)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3				

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▌ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP07

JACOBS

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 16/05/16 - 16/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP07_0.0	○				FILL: Sandy SILT: (MH) brown, dry, medium density, minor fine gravel, fine to medium grained sands, minor rootlets, no odour.	MD	D	
	0	A		A2-TP07_0.1	○				FILL: silty Sandy CLAY: (CL) brown, dry, firm, some small to medium ironstone gravel, trace small to medium fragments of ironstone, medium to coarse grained sands, no odour.	F	D	
									FILL: silty Clayey SAND: (SC) light brown and brown, slightly moist, compact, fine grained sands, no odour.	CO	Sl. M	
	0	A		A2-TP07_0.5	○							
									Silty CLAY: (CL) grey mottled orange/brown and red/brown, moist, very stiff, no odour.	VSt	M	pp (400, 450, 430)
							1					
	0	A		A2-TP07_1.0	○							
									As above but grey mottled red/brown and stiff.	St	M	pp (320, 330, 280)
							2					pp (280, 300, 300)
	0	A		A2-TP07_2.0	○							
									Silty CLAY: (CL) grey mottled red/brown and orange/brown, moist, firm, no odour.	F	M	
	0	A		A2-TP07_2.5	○							
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP08

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 16/05/16 - 16/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP08_0.0	○				FILL: Sandy SILT: (MH) brown, dry, medium density, fine to medium grained sands, some rootlets, no odour.	MD	D	
	0	A		A2-TP08_0.3	○				FILL: silty Sandy CLAY: (CL) light brown and brown, dry, hard, fine grained sands, no odour.	H	D	
									Silty CLAY: (CL) brown mottled orange/brown, slightly moist, stiff, trace fine grained sands, no odour.	St	Sl. M	
	0	A		A2-TP08_0.3 - 0.8 A2-TP08_0.5	○							pp (520, 500, 510)
									Silty CLAY: (CL) grey/brown mottled red/brown, slightly moist, soft to firm, no odour.	S - F	Sl. M	
							1					
	0	A		A2-TP08_1.0	○							pp (270, 280, 260)
									As above but grey mottled red/brown and orange/brown, trace fine grained sands.	S - F	Sl. M	
							2					
	0	A		A2-TP08_2.0	○							pp (280, 290, 280)
									As above but grey mottled red/brown and soft.	S	Sl. M	
	0	A		A2-TP08_2.5	○							pp (250, 270, 270)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP09

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 20/05/16 - 20/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP09_0.0	○					FILL: Silty CLAY: (CL) brown, dry, very stiff, minor fine gravel and fine grained sands, minor rootlets, no odour.	VSt	D	
										FILL: Silty CLAY: (CL) red/brown and grey, dry, hard, trace fine to medium ironstone gravel, minor fine grained sands, no odour.	H	D	
	0	A		A2-TP09_0.3	○								
										Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	
	0	A		A2-TP09_0.5	○								pp (420, 460, 470)
	0	A		A2-TP09_0.4 - 0.9	█					As above but red/brown mottled grey/brown, stiff and trace rootlets.	St	Sl. M	
								1					
	0	A		A2-TP09_1.0	○								pp (420, 430, 450)
										Silty CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, firm, some fine to medium ironstone gravel, minor small to medium fragments of ironstone, trace fine grained sands, no odour.	F	Sl. M	
								2					
	0	A		A2-TP09_2.0	○								pp (320, 320, 310)
										As above but grey mottled orange/brown, soft and minor fine to medium ironstone gravel.	S	Sl. M	
	0	A		A2-TP09_2.5	○								pp (180, 220, 230)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP10

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN		
Location: Bankstown Airport - Site 2	Start - Finish Date: 19/05/16 - 19/05/16	Rig: Backhoe	Eastings: mE		Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:		Checked: MS

FIELD DATA										SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP10_0.0	○				▩	FILL: Silty CLAY: (CL) brown, dry, stiff, trace fine gravel, trace fine to medium grained sands, minor rootlets, no odour.	St	D	
	0	A		A2-TP10_0.2	○				▩	FILL: silty Sandy CLAY: (CL) light brown and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2-TP10_0.5	○				▨	Silty CLAY: (CL) brown mottled orange/brown and dark brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	pp (360, 340, 380)
									▨	Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, stiff, minor fine grained sands, no odour.	St	Sl. M	
	0	A		A2-TP10_1.0	○			1	▨				pp (450, 500, 480)
									▨	As above but firm, minor fine ironstone gravel and some fine grained sands.	F	Sl. M	
	0	A		A2-TP10_2.0	○			2	▨				pp (350, 310, 340)
									▨	As above.	F	Sl. M	
	0	A		A2-TP10_2.5	○				▨				pp (320, 350, 360)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP11

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings:	mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 19/05/16 - 19/05/16	Rig: Backhoe	Eastings:	mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:		Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP11_0.0	○					FILL: Silty CLAY: (CL) dark brown/grey, dry, stiff, trace fine gravel, minor fine to medium grained sands, minor rootlets, no odour.	St	D	
	0	A		A2-TP11_0.2	○					FILL: sandy Silty CLAY: (CL) brown and grey/brown, dry, hard, some fine to medium grained sands, no odour.	H	D	
										Silty CLAY: (CL) brown and orange/brown, slightly moist, stiff, minor rootlets, no odour.	St	Sl. M	
	0 0	A A		A2-TP11_0.5 A2-TP11_0.4 - 0.8	○ ▮								pp (350, 390, 400)
										As above but grey mottled red/brown.	St	Sl. M	
	0	A		A2-TP11_1.0	○			1					pp (350, 310, 350)
										Silty CLAY: (CL) orange/brown mottled grey and red/brown, slightly moist, firm, trace fine grained sands, no odour.	F	Sl. M	
	0	A		A2-TP11_2.0	○			2					pp (300, 300, 330)
										As above but grey mottled orange/brown.	F	Sl. M	
	0	A		A2-TP11_2.5	○								pp (310, 340, 310)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING

0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING

A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP12

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 20/05/16 - 20/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP12_0.0	○			FILL: Silty CLAY: (CL) dark brown, dry, stiff, some fine to medium gravel, trace small fragments of sandstone and small to medium pieces of asphalt, minor fine grained sands, minor rootlets, no odour.	St	D	
								FILL: sandy Silty CLAY: (CL) light brown and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2-TP12_0.5	○						
								Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	pp (520, 520, 530)
								As above but brown mottled orange/brown and red/brown and stiff.	St	Sl. M	
							1				
	0	A		A2-TP12_1.0	○						pp (420, 450, 430)
								Silty CLAY: (CL) orange/brown mottled grey and red/brown, slightly moist, firm, no odour.	F	Sl. M	
							2				
	0	A		A2-TP12_2.0	○						pp (320, 340, 320)
								As above but grey mottled orange/brown and trace fine grained sands.	F	Sl. M	
	0	A		A2-TP12_2.5	○						pp (290, 310, 320)
								Test Pit terminated at 2.5 m bgl. Limit of Investigation			
							3				

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◀ ▶ = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP13

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 19/05/16 - 19/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP13_0.0	○			▩	FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine to medium gravel, trace fine grained sands, minor rootlets, no odour.	St	D	
	1	A		A2-TP13_0.2	○			▩	FILL: sandy Silty CLAY: (CL) light brown/grey, dry, hard, minor small to medium pieces of sandstone and aggregate, minor fine to medium gravel, no odour.	H	D	
								▩	As above but brown and minor medium ironstone gravel.	H	D	
	0	A		A2-TP13_0.5	○			▧	Silty CLAY: (CL) brown mottled orange/brown and grey/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	pp (530, 490, 500)
								▧	As above but brown mottled red/brown and firm.	F	Sl. M	
	0	A		A2-TP13_1.0	○		1	▧				pp (290, 260, 300)
								▧	Silty CLAY: (CL) orange/brown mottled grey and red/brown, slightly moist, firm, minor fine grained sands, no odour.	F	Sl. M	
	0	A		A2-TP13_2.0	○		2	▧				pp (310, 330, 300)
								▧	As above but grey mottled orange/brown and trace fine ironstone gravel.	F	Sl. M	
	0	A		A2-TP13_2.5	○			▧				pp (280, 270, 260)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP14

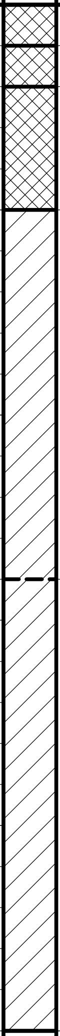
Project: Contamination Investigation
Location: Bankstown Airport - Site 2
Job No: IA110700

Client: Bankstown Airport Limited
Start - Finish Date: 19/05/16 - 19/05/16
Bore dia: 450 mm

Driller: Ken Coles
Rig: Backhoe
Surface Conditions: Grass

Northings: mN
Eastings: mE
RL:

Logged: BC
Checked: MS



PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	soil description (soil type, unified classification, colour, structure, particle characteristics, minor components)	consistency/ density	moisture condition	comments (drilling method, well construction, water and additional observations)
	1	A		A2-TP14_0.0	○			FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine to medium gravel and small to medium pieces of sandstone, trace small pieces of wire, minor medium grained sands, minor rootlets, no odour.	St	D	
								FILL: Asphalt and Concrete. grey and dark grey, dry, hard, medium to large fragments and pieces of asphalt and concrete, no odour.	H	D	
								FILL: Silty CLAY: (CL) brown/grey, dry, hard, minor fine to medium gravel and medium pieces of sandstone and asphalt, some fine grained sands, no odour.	H	D	
	1	A		A2-TP14_0.3	○						
	0	A		A2-TP14_0.5	○				St	Sl. M	
								Silty CLAY: (CL) brown, slightly moist, stiff, minor rootlets, no odour.			pp (420, 420, 380)
								As above but minor small to medium tree roots.	St	Sl. M	
							1				
	0	A		A2-TP14_1.0	○						pp (230, 250, 230)
								Silty CLAY: (CL) orange/brown mottled grey, slightly moist, firm, no odour.	F	Sl. M	
							2				
	0	A		A2-TP14_2.0	○						pp (320, 340, 340)
								As above but trace fine to medium ironstone gravel.	F	Sl. M	
	0	A		A2-TP14_2.5	○						pp (330, 310, 310)
								Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3				

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▌ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP15

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 19/05/16 - 19/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP15_0.0	○			FILL: Silty CLAY: (CL) dark brown, dry, firm, minor medium gravel, minor fine to medium grained sands, minor rootlets, no odour.	F	D	
								FILL sandy Silty CLAY: (CL) light grey and grey, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2-TP15_0.2	○						
								Silty CLAY: (CL) brown, slightly moist, stiff, minor rootlets, no odour.	S	Sl. M	
	0	A		A2-TP15_0.5	○						pp (400, 380, 360)
								As above but brown mottled grey and firm.	F	Sl. M	
						1					
	0	A		A2-TP15_1.0	○						pp (280, 280, 260)
								Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, stiff, no odour.	St	Sl. M	
						2					
	0	A		A2-TP15_2.0	○						pp (430, 430, 410)
								As above but orange/brown mottled red/brown and grey, firm, minor fine grained sands and trace fine to medium ironstone gravel.	F	Sl. M	
	0	A		A2-TP15_2.5	○						pp (380, 360, 340)
								Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
						3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP16

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 20/05/16 - 20/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP16_0.0	○					FILL: Silty CLAY: (CL) dark brown, dry, stiff, minor fine gravel, minor fine grained sands, minor rootlets, no odour.	St	D	
										As above but some fine gravel.	St	D	
	0	A		A2-TP16_0.3	○					FILL: sandy Silty CLAY: (CL) light brown and brown, dry, very stiff, fine grained sands, no odour.	VSt	D	
	0	A		A2-TP16_0.5	○					Silty CLAY: (CL) brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	pp (490, 520, 510)
										As above but firm and no rootlets.	F	Sl. M	
								1					
	0	A		A2-TP16_1.0	○								pp (340, 350, 320)
										Silty CLAY: (CL) brown mottled grey, slightly moist, soft, trace ironstone gravel, no odour.	S	Sl. M	
								2					
	0	A		A2-TP16_2.0	○								pp (230, 260, 240)
	0	A		A2-TP16_2.5	○					As above.	S	Sl. M	pp (280, 280, 290)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▮ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP17

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 18/05/16 - 18/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

FIELD DATA									SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP17_0.0	○				▨	FILL: Silty CLAY: (CL) grey/brown, dry, stiff, minor fine gravel, trace fine grained sands, minor rootlets, no odour.	St	D	
									▨	As above but brown and orange/brown and some fine grained sands.	St	D	
									▨	FILL: Silty CLAY: (CL) light brown and brown, dry, very stiff, minor small to medium fragments of ash/charcoal, fine grained sands, no odour.	VSt	D	
	1	A		A2-TP17_0.5	○				▨				
									▧	Silty CLAY: (CL) brown mottled orange/brown and dark brown, slightly moist, stiff, minor rootlets, no odour.	St	Sl. M	pp (320, 350, 330)
									▧	As above but grey mottled red/brown and firm.	F	Sl. M	
								1	▧				
	0	A		A2-TP17_1.0	○				▧				pp (270, 310, 300)
									▧	Silty CLAY: (CL) grey mottled orange/brown and grey/brown, slightly moist, firm, trace fine grained sands, no odour.	F	Sl. M	
								2	▧				
	0	A		A2-TP17_2.0	○				▧				pp (270, 290, 300)
									▧	As above but grey mottled orange/brown.	F	Sl. M	
	0	A		A2-TP17_2.5	○				▧				pp (290, 310, 310)
										Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
								3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP18

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 17/05/16 - 17/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP18_0.0	○			▨	FILL: Silty CLAY: (CL) brown dry, firm, minor fine gravel, minor fine grained sands, minor rootlets, no odour.	F	D	
	0	A		A2-TP18_0.3	○			▨	FILL: silty Sandy CLAY: light brown and brown, dry, very stiff, trace fine gravel, fine grained sands, no odour.	VSt	D	
									Test Pit terminated at 0.4 m bgl. Low Voltage Power Cable Encountered.			
							1					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
⊣◀ ▶⊢ = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP19

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 20/05/16 - 20/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP19_0.0	○				▩	FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine gravel and fine grained sands, minor rootlets, no odour.	St	D	
									▩	FILL: sandy Silty CLAY: (CL) light brown and brown, dry, very stiff, trace fine gravel, fine grained sands, no odour.	VSt	D	
	0	A		A2-TP19_0.2, A2-QC03, A2-QC04	○				▩				
									▨	Silty CLAY: (CL) brown mottled red/brown, slightly moist, stiff, minor rootlets, no odour.	St	Sl. M	
	0	A		A2-TP19_0.5	○				▨				
									▨	As above but grey mottled red/brown and firm, no rootlets.	F	Sl. M	
	0	A		A2-TP19_1.0	○			1	▨				
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
■ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP20

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 20/05/16 - 20/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP20_0.0	○				▩	FILL: Silty CLAY: (CL) brown, dry, stiff, some fine to medium gravel, minor small pieces of concrete and asphalt, minor fine grained sands, minor rootlets, no odour. As above but dark brown and very stiff.	St VSt	D D	
	0	A		A2-TP20_0.5	○				▨	Silty CLAY: (CL) brown, slightly moist, firm, trace rootlets, no odour.	F	Sl. M	
	0	A		A2-TP20_1.0	○			1	▨	Sandy CLAY: (CL) brown/grey mottled orange/brown, slightly moist, soft, fine grained sands, trace silt, no odour.	S	Sl. M	
								2		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP21

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 17/05/16 - 17/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP21_0.0	○				▨	FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine gravel, trace fine to medium grained sands, no odour.	St	D	
									▨	FILL: sandy Silty CLAY: (CL) light brown and brown, dry, hard, trace fine gravel, fine grained sands, no odour.	H	D	
	0	A		A2-TP21_0.2	○				▨				
	0	A		A2-TP21_0.5	○				▧	Silty CLAY: (CL) brown mottled orange/brown and red/brown, slightly moist, very stiff, minor rootlets, no odour.	VSt	Sl. M	
									▧	Silty CLAY: (CL) grey mottled red/brown, slightly moist, firm, minor fine grained sands, minor rootlets, no odour.	F	Sl. M	
	0	A		A2-TP21_1.0	○			1	▧				
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

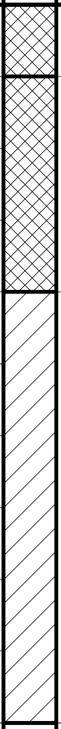
MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP22

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 16/05/16 - 16/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP22_0.0	○					FILL: Sandy SILT: (MH) brown, dry, medium density, minor fine gravel, minor rootlets, no odour.	MD	D	
										FILL: sandy Silty CLAY: (CL) light brown, dry, hard, fine grained sands, no odour	H	D	
	0	A		A2-TP22_0.2	○								
										Silty CLAY: (CL) brown mottled orange/brown, slightly moist, very stiff, trace fine ironstone gravel, trace rootlets, no odour.	VSt	Sl. M	
	0	A		A2-TP22_0.5	○								
										As above but grey mottled red/brown and trace small roots.	VSt	Sl. M	
	0	A		A2-TP22_1.0	○								
								1		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP23

JACOBS

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 16/05/16 - 16/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2_TP23_0.0	○				FILL: Sandy SILT: (MH) dark brown, dry, medium density, minor fine gravel, minor rootlets, no odour.	MD	D	
									FILL: sandy Silty CLAY: (CL) light brown and brown, dry, hard, fine grained sands, no odour.	H	D	
	0	A		A2_TP23_0.2	○							
									Silty CLAY: (CL) grey/brown mottled orange/brown, slightly moist, very stiff, no odour.	VSt	Sl. M	
	0	A		A2_TP23_0.5	○							pp (440, 470, 430)
									As above but grey mottled orange/brown and red/brown and stiff.	St	Sl. M	
							1					
	0	A		A2_TP23_1.0	○							pp (410, 440, 420)
									As above but firm.	F	Sl. M	
							2					
	0	A		A2_TP23_2.0	○							pp (330, 350, 340)
									As above but grey mottled red/brown.	F	Sl. M	
	0	A		A2_TP23_2.5	○							pp (310, 290, 320)
									Test Pit terminated at 2.5 m bgl. Limit of Investigation.			
							3					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP24

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 30/05/16 - 30/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA							SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP24_0.0	○			▩	FILL: sandy Silty CLAY: (CL) brown, dry, very stiff, minor fine gravel, fine grained sands, no odour.	VSt	D	
								▨	Silty CLAY: (CL) brown mottled orange/brown, dry, very stiff, minor rootlets, no odour.	VSt	D	
	0	A		A2-TP24_0.5	○			▨	As above but grey mottled orange/brown and red/brown, slightly moist and stiff.	St	Sl. M	
	0	A		A2-TP24_1.0	○		1	▨				
									Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
							2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP25

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP25_0.0	○			▩	FILL: Silty CLAY: (CL) dark brown, dry, stiff, minor fine gravel, some fine grained sands, minor rootlets, no odour.	St	D	
	0	A		A2-TP25_0.3, A2-QC05, A2-QC06	○			▩	FILL: silty Sandy CLAY: (CL) very light brown and brown, dry, very stiff, fine grained sands, no odour.	VSt	D	
	0	A		A2-TP25_0.5	○			▨	Silty CLAY: (CL) brown mottled orange/brown, slightly moist, stiff, minor rootlets, trace fine grained sands, no odour.	St	Sl. M	
	0	A		A2-TP25_1.0	○		1	▨	Silty CLAY: (CL) grey mottled red/brown and orange/brown, slightly moist, firm, trace fine grained sands and rootlets, no odour.	F	Sl. M	
							2		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▌ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

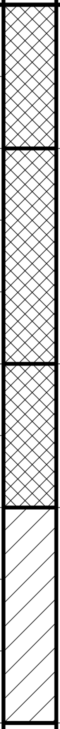
MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP26

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings:	mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings:	mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:		Checked: MS



PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP26_0.0	○				FILL: clayey Sandy SILT: (MH) dark brown, dry, medium density, fine grained sands, some fine to medium gravel, minor rootlets, no odour.	MD	D	
									FILL: silty Clayey SAND: (SC) very light brown/grey and brown, dry, very dense, fine grained sands, no odour.	VD	D	
	0	A		A2-TP26_0.4	○							
									FILL: Silty CLAY: (CL) brown, dark brown and grey/brown, dry, very stiff, minor fine gravel, trace small to medium fragments of sandstone and medium to large fragments of ash/charcoal, no odour.	VSt	D	
	1	A		A2-TP26_0.6	○							
									Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, stiff, minor rootlets and medium roots, no odour.	St	Sl. M	
	0	A		A2-TP26_1.0	○							
								1	Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2				

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP27

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP27_0.0	○				▩	FILL: Silty CLAY: (CL) dark brown, dry, stiff, some fine gravel, trace small to medium fragments of sandstone and ash/charcoal, trace medium aggregate, some fine grained sands, minor rootlets, no odour.	St	D	
									▩	FILL: clayey Silty SAND: (SM) very light brown and brown, dry, compact, fine grained sands, no odour.	CO	D	
	0	A		A2-TP27_0.3	○				▩				
									▨	Silty CLAY: (CL) brown mottled orange/brown, dry, very stiff, trace fine grained sands and rootlets, no odour.	VSt	D	
	0	A		A2-TP27_0.6	○				▨				
									▨	Silty CLAY: (CL) grey mottled red/brown, slightly moist, firm, trace rootlets, no odour.	F	Sl. M	
	0	A		A2-TP27_1.0	○				▨				
								1		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

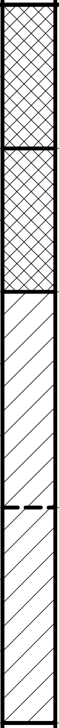
CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP28

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS



	FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP28_0.0	○					FILL: gravelly Silty CLAY: (CL) dark brown, dry, stiff, fine to medium gravel, trace small fragments of sandstone, trace small to medium fragments of ash/charcoal, trace medium aggregate, some fine grained sands, minor rootlets, no odour.	St	D	
	0	A		A2-TP28_0.3	○					FILL: clayey Silty SAND: (SM) light brown and brown, dry, very dense, trace fine gravel, fine grained sands, no odour.	VD	D	
	0	A		A2-TP28_0.5	○					Silty CLAY: (CL) brown mottled orange/brown and grey/brown, dry, stiff, minor rootlets, no odour.	St	D	
	0	A		A2-TP28_1.0	○			1		Silty CLAY: (CL) grey mottled orange/brown and red/brown, slightly moist, stiff, trace fine grained sands and rootlets, no odour.	St	Sl. M	
								2		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP29

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP29_0.0	○					FILL: Sandy CLAY: (CL) brown, dry, stiff, some fine to medium gravel, trace small to medium pieces of sandstone and ironstone, trace small fragments of glass, fine grained sands, minor rootlets, no odour.	St	D	
										FILL: clayey silty SAND: (SM) very light brown and brown, dry, very dense, fine grained sands, no odour.	VD	D	
	0	A		A2-TP29_0.3	○								
										Silty CLAY: (CL) brown and dark brown, dry, very stiff, minor rootlets, no odour.	VSt	D	
	0	A		A2-TP29_0.5	○								
										As above but brown mottled orange brown.	VSt	D	
										Silty CLAY: (CL) grey mottled red/brown, slightly moist, stiff, trace rootlets and medium roots, no odour.	St	Sl. M	
	0	A		A2-TP29_1.0	○			1					
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
⊣◀ ▶⊢ = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP30

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP30_0.0	○				▩	FILL: Silty CLAY: (CL) brown/grey, dry, stiff, some fine gravel, minor fine grained sands, minor rootlets, no odour.	St	D	
	0	A		A2-TP30_0.2	○				▩	FILL: Silty CLAY: (CL) grey, dry, very stiff to hard, minor fine medium gravel, some fine grained sands, trace rootlets, no odour.	VSt - H	D	
									▨	Silty CLAY: (CL) brown and grey/brown mottled orange/brown, dry, very stiff, trace rootlets, no odour.	VSt	D	
	0	A		A2-TP30_0.5	○				▨				
									▨	As above but grey mottled red/brown and orange/brown, slightly moist and stiff.	St	Sl. M	
	0	A		A2-TP30_1.0	○				▨				
								1		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP31

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP31_0.0, A2-QC07, A2-QC08	○					FILL: Silty CLAY: (CL) dark brown, dry, very stiff, some fine to medium gravel, trace fine ironstone gravel, trace fine grained sands, minor rootlets, no odour.	VSt	D	
										FILL: clayey Silty SAND: (SM) brown, dry, compact, trace fine gravel, fine to medium grained sands, no odour.	CO	D	
										As above but very light grey and brown.	CO	D	
	0	A		A2-TP31_0.5	○								
										Silty CLAY: (CL) grey mottled orange/brown, slightly moist, stiff, trace rootlets and medium roots, no odour	St	Sl. M	
	0	A		A2-TP31_1.0	○			1					
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▐ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP32

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN		
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC	
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS	

	FIELD DATA									SOIL DESCRIPTION	SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	0	A		A2-TP32_0.0	○				▩	FILL: Silty CLAY: (CL) brown, dry, stiff, minor fine gravel, trace small to medium aggregate, trace fine grained sands, minor rootlets, no odour.	St	D	
									▩	FILL: clayey Silty SAND: (SM) light brown and brown, dry, very dense, fine grained sands, no odour.	VD	S	
	0	A		A2-TP32_0.2	○				▩				
									▨	Silty CLAY: (CL) brown mottled orange/brown and red/brown, slightly moist, firm, minor fine grained sands, trace rootlets, no odour.	F	Sl. M	
	0	A		A2-TP32_0.5	○				▨				
									▨	As above but light grey mottled orange/brown and red/brown and trace fine ironstone gravel.	F	Sl. M	
	0	A		A2-TP32_1.0	○				▨				
								1		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP33

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 31/05/16 - 31/05/16	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP33_0.0	○				▨	FILL: gravelly Sandy SILT: (MH) dark brown/grey, dry, medium density, fine gravel, trace small to medium fragments of asphalt and aggregate, fine to medium grained sands, minor rootlets, no odour.	MD	D	
									▨	FILL: clayey Silty SAND: (SM) light brown and brown, dry, very dense, fine grained sands, no odour.	VD	D	
	0	A		A2-TP33_0.2	○				▨				
									▧	Silty CLAY: (CL) brown mottled orange/brown, slightly moist, stiff, trace rootlets, no odour.	St	Sl. M	
									▧	Burnt tree root observed.			
	0	A		A2-TP33_0.5	○				▧				
									▧	As above but grey mottled red/brown and orange/brown, firm and trace small to medium tree roots.	F	Sl. M	
	0	A		A2-TP33_1.0	○				▧				
								1		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
0 No visible evidence of contamination
1 Slight visible contamination
2 Visible contamination
3 Significant visible contamination

ODOUR RANKING
A No Non-Natural odours
B Slight Non-Natural odours
C Moderate Non-Natural odours
D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
▼ = Water level (static)
▽ = Water level (during drilling)
◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

BOREHOLE No. A2-TP34

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 1/06/15 - 1/06/15	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP34_0.0	○				▨	FILL: Silty CLAY: (CL) brown/grey, dry, stiff, minor fine to medium gravel, trace medium to large aggregate, fine ironstone gravel and small fragments of ash/charcoal, some fine grained sands, minor rootlets, no odour.	St	D	
									▨	FILL: Silty CLAY: (CL) grey, brown and red/brown, dry, hard, trace small to medium ironstone gravel, trace fine grained sands, minor rootlets, no odour.	H	D	
	0	A		A2-TP34_0.3	○				▨				
									▨	FILL: silty Clayey SAND: (SC) very light brown and brown, dry, compact, fine grained sands, no odour.	CO	D	
	0	A		A2-TP34_0.5	○				▨				
									▧	Silty CLAY: (CL) brown and dark brown, slightly moist, stiff, trace rootlets and small to medium roots, no odour.	St	Sl. M	
									▧	As above but grey mottled orange/brown and red/brown.	St	Sl. M	
	0	A		A2-TP34_1.0	○			1	▧				
										Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING
- 0 No visible evidence of contamination
- 1 Slight visible contamination
- 2 Visible contamination
- 3 Significant visible contamination

ODOUR RANKING
- A No Non-Natural odours
- B Slight Non-Natural odours
- C Moderate Non-Natural odours
- D Strong Non-Natural odours

FIELD DATA ABBREVIATIONS
- Suv = Uncorrected vane shear (kPa)
- Sup = Pocket penetrometer (kPa)
- N = SPT blows per 300mm
- FPM = Field permeability
- PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS
- ▼ = Water level (static)
- ▽ = Water level (during drilling)
- ◄ ► = Outflow / Inflow

FIELD DATA SYMBOLS
- × = Shear vane test
- ⊥ = Pocket Penetrometer test
- ▽ = Standard Penetration Test (SPT top = start of N blowcount)
- ▼ = SPT Spoon Sample (Pushed)
- █ = Undisturbed Tube Sample
- ● = Disturbed Sample
- ▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

BOREHOLE No. A2-TP35

Project: Contamination Investigation	Client: Bankstown Airport Limited	Driller: Ken Coles	Northings: mN	
Location: Bankstown Airport - Site 2	Start - Finish Date: 1/06/15 - 1/06/15	Rig: Backhoe	Eastings: mE	Logged: BC
Job No: IA110700	Bore dia: 450 mm	Surface Conditions: Grass	RL:	Checked: MS

	FIELD DATA								SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
PID (ppm)	visual ranking	odour ranking	field test XRF (ppm)	sample ID	sample type	field tests	ground water	depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	1	A		A2-TP35_0.0	○					FILL: Silty CLAY: (CL) brown/grey, dry, stiff, some fine to medium gravel, trace fine ironstone gravel and small to medium fragments of ash/charcoal, some fine to medium grained sands, minor rootlets, no odour.	St	D	
										FILL: silty Clayey SAND: (SC) very light grey/brown and brown, dry, compact, trace large tree root, fine grained sands, no odour.	CO	D	
	0	A		A2-TP35_0.2	○								
										Silty CLAY: (CL) brown mottled grey/brown and orange/brown, slightly moist, very stiff, minor rootlets and trace small roots, no odour.	VSt	Sl. M	
	0	A		A2-TP35_0.5	○								
										Silty CLAY: (CL) grey mottled red/brown, slightly moist, firm to stiff, trace rootlets, no odour.	F - St	Sl. M	
	0	A		A2-TP35_1.0	○								
								1		Test Pit terminated at 1.0 m bgl. Limit of Investigation.			
								2					

VISUAL RANKING

0	No visible evidence of contamination
1	Slight visible contamination
2	Visible contamination
3	Significant visible contamination

ODOUR RANKING

A	No Non-Natural odours
B	Slight Non-Natural odours
C	Moderate Non-Natural odours
D	Strong Non-Natural odours

FIELD DATA ABBREVIATIONS

Suv = Uncorrected vane shear (kPa)
Sup = Pocket penetrometer (kPa)
N = SPT blows per 300mm
FPM = Field permeability
PID = Photoionisation detector reading (ppm, V/V)

GROUNDWATER SYMBOLS

▼ = Water level (static)
▽ = Water level (during drilling)
◄ ►— = Outflow / Inflow

FIELD DATA SYMBOLS

× = Shear vane test
⊥ = Pocket Penetrometer test
▽ = Standard Penetration Test (SPT top = start of N blowcount)
▼ = SPT Spoon Sample (Pushed)
█ = Undisturbed Tube Sample
● = Disturbed Sample
▯ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	<10
L	(loose)	10 - 20
MD	(medium dense)	20 - 30
D	(dense)	30 - 50
VD	(very dense)	>50
CO	(compact)	>50/150mm

MOISTURE CONDITION

D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH1
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 19/5/16
DATE COMPLETED : 19/5/16
DATE LOGGED : 19/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING: PROGRESS DRILLING & CASING	DRILLING: PROGRESS WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA		VE	Not Observed		0.0		Silty CLAY: brown, low to medium plasticity, trace of rootlets	D		FILL
					0.30m	CI	Silty CLAY: pale grey, medium plasticity, trace of rootlets	D - M		ALLUVIUM
AD/T				0.50m SPT 5,6,7 N=13 0.95m			At 0.6m, as above but grey, brown, trace of organics			
				1.50m SPT 5,6,9 N=15 1.95m	1.50m	CH	Silty CLAY: grey, brown, high plasticity	M	St	
				3.00m SPT 4,4,7 N=11 3.45m						
				4.50m SPT 4,6,8 N=14 4.95m			At 4.5m, as above but trace of ironstone gravel			
				6.00m SPT 3,6,7 N=13 6.45m						
		E			7.00m	CS	Sandy CLAY: grey, high plasticity, medium to coarse grained sand		VSt	
				7.50m SPT 5,11,18 N=29 7.95m	8.0					

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH1
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 19/5/16
DATE COMPLETED : 19/5/16
DATE LOGGED : 19/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
					8.0		CS	8.10m		VSt	ALLUVIUM
AD/T		E	Not Observed					Silty CLAY: grey, red-brown, high plasticity, with ironstone gravel			
					9.0		CH		M	St	
				9.50m SPT 4,6,8 N=14							
				9.95m				9.95m			
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH2
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 17/5/16
DATE COMPLETED : 17/5/16
DATE LOGGED : 17/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE	Not Observed		0.0		Silty CLAY: pale brown, low plasticity, trace of fine to medium grained sand and rootlets	D		TOPSOIL
					0.10m		Silty SAND: pale brown, fine to medium grained sand, trace of clay and rootlets			FILL
				0.50m SPT 3,5,5 N=10 0.95m	0.50m	CL-CI	Silty CLAY: grey, red-brown, low plasticity	M	St	ALLUVIUM
				1.50m SPT 4,7,9 N=16 1.95m	1.5		At 1.5m, as above but clay is low to medium plasticity			
				3.00m SPT 3,4,6 N=10 3.45m	3.00m	CH	Silty CLAY: grey, brown, high plasticity			
				4.50m SPT 4,5,7 N=12 4.95m	4.5		At 4.5m, as above but trace of ironstone gravel			
				6.00m SPT 3,5,7 N=12 6.45m	6.0					
				7.50m SPT 4,5,8 N=13 7.95m	7.5		At 7.5m, as above but grey, red-brown, trace of ironstone gravel			
					8.0					

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH2
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 17/5/16
DATE COMPLETED : 17/5/16
DATE LOGGED : 17/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE	Not Observed	9.50m SPT 6,9,12 N=21 9.95m	8.0 9.0		CH	Silty CLAY: grey, brown, high plasticity *(continued)* 9.95m	M	St VSt	ALLUVIUM
					10.0 11.0 12.0 13.0 14.0 15.0 16.0			End of borehole at 9.95m, target depth			

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

SKM LIB 1.01.2.GLB Log IS AU BOREHOLE 2 IA110700 GINT.GPJ <<DrawingFile>> 14/06/2016 18:17 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: SKM 1.01.2 2013-10-17 Prj: SKM 1.01.1 2013-10-16

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH3
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 17/5/16
DATE COMPLETED : 17/5/16
DATE LOGGED : 17/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE	Not Observed		0.0			Silty CLAY: pale brown, low plasticity, with rootlets	D		FILL
				0.50m SPT 3,4,5 N=9 0.95m	0.50m		CL-CI	Silty CLAY: grey, brown, low to medium plasticity	M	St	ALLUVIUM
					1.0						
				1.50m SPT 2,4,5 N=9 1.95m				At 1.5m, as above but clay is medium plasticity, trace of rootlets			
				2.00m U 2.50m	2.0						
				3.00m SPT 3,4,7 N=11 3.45m	3.00m		CH	Silty CLAY: grey, red-brown, high plasticity, trace of medium to coarse grained sand			
					4.0						
				4.50m SPT 4,5,6 N=11 4.95m	4.50m		CH	Silty CLAY: grey, red-brown, high plasticity			
					5.0						
		E		6.00m SPT 3,6,7 N=13 6.45m	6.0						
					7.0						
				7.50m SPT 3,5,9 N=14 7.95m				At 7.5m, as above but trace of ironstone gravel			
					8.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

NON-CORE DRILL HOLE - GEOLOGICAL LOG

JACOBS

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH3
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 17/5/16
DATE COMPLETED : 17/5/16
DATE LOGGED : 17/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E	Not Observed		8.0		CH	Silty CLAY: grey, red-brown, high plasticity *(continued)*	M	St	ALLUVIUM
								At 8.5m, as above but brown, red-brown			
					9.0						
				9.50m SPT 6,9,12 N=21						VSt	
				9.95m			9.95m				
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH4
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 19/5/16
DATE COMPLETED : 19/5/16
DATE LOGGED : 19/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA		VE			0.0 – 0.30m			Silty CLAY: brown, low to medium plasticity, with rootlets	D		FILL
AD/T				0.50m SPT 4,7,7 N=14 0.95m	0.30m – 0.80m		CI	Silty CLAY: grey, medium plasticity, trace of rootlets	D - M	St	ALLUVIUM
				1.50m SPT 3,6,6 N=12 1.95m 3.00m SPT 3,5,7 N=12 3.45m	0.80m – 4.50m		CH	Silty CLAY: grey, brown, high plasticity, trace of rootlets	M		
		E	▽ (4.50m)	4.50m SPT 7,12,14 N=26 4.95m	4.50m – 5.30m		SM	Silty SAND: grey, brown, medium to coarse grained sand, trace of clay	M - W	MD	
		VE		6.00m SPT 4,6,8 N=14 6.45m 7.50m SPT 3,5,8 N=13 7.95m	5.30m – 8.0		CH	Silty CLAY: grey, red-brown, high plasticity	M	St	

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH4
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 19/5/16
DATE COMPLETED : 19/5/16
DATE LOGGED : 19/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE			8.0		CH	Silty CLAY: grey, red-brown, high plasticity *(continued)*	M	St	ALLUVIUM
					9.0						
				9.50m SPT 5,9,10 N=19 9.95m			CH	9.50m Silty CLAY: grey, high plasticity, trace of ironstone gravel and organics 9.95m		VSt	
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

SKM LIB 1.01.2.GLB Log IS AU BOREHOLE 2 IA110700 GINT.GPJ <<DrawingFile>> 14/06/2016 18:17 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: SKM 1.01.2 2013-10-17 Prj: SKM 1.01.1 2013-10-16

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : A2-BH5
FILE / JOB NO : IA110700
SHEET : 1 OF 2

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 16/5/16
DATE COMPLETED : 16/5/16
DATE LOGGED : 16/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL				
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE			0.0		Silty SAND: pale brown, fine to medium grained sand	D		TOPSOIL
					0.15m		Clayey SAND: brown, fine to coarse grained sand, trace of fine to coarse gravel			FILL
				0.50m SPT 7,5,4 N=9 0.95m						
					1.0 (1.00m)	CI-CH	Silty CLAY: grey, brown, medium to high plasticity	D - M	St	ALLUVIUM
				1.50m SPT 3,4,8 N=12 1.95m						
					2.0					
		E		3.00m SPT 6,7,9 N=16 3.45m	3.0 (3.00m)	CH	Silty CLAY: grey, brown, high plasticity, trace of ironstone gravel	M		
					4.0					
			▽	4.50m SPT 13,10,10 N=20 4.95m			At 4.5m, as above but grey, red-brown, with sand		VSt	
					5.0					
				6.00m SPT 3,5,7 N=12 6.45m	6.0					
					6.10m	CI-CH	Silty CLAY: grey, brown, medium to high plasticity, trace of ironstone gravel		St	
					7.0					
				7.50m SPT 4,8,12 N=20 7.95m	7.50m	CH	Silty CLAY: grey, brown, high plasticity, with ironstone gravel		VSt	
					8.0					

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH5
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 16/5/16
DATE COMPLETED : 16/5/16
DATE LOGGED : 16/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
AD/T		E		9.50m SPT 4,5,7 N=12 9.95m	8.0 9.0		CH	Silty CLAY: grey, brown, high plasticity, with ironstone gravel *(continued)* 9.95m	M	VSt St	ALLUVIUM
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH6
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 17/5/16
DATE COMPLETED : 17/5/16
DATE LOGGED : 17/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL				
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE			0.0 – 0.10m		Silty CLAY: pale brown, low plasticity, trace of rootlets	D		TOPSOIL
					0.10m – 0.50m		Silty CLAY: pale brown, low to medium plasticity, trace of rootlets	D		FILL
				0.50m SPT 5,6,7 N=13 0.95m 1.50m SPT 3,4,4 N=8 1.95m 3.00m SPT 3,5,7 N=12 3.45m	0.50m – 4.00m	CI-CH	Silty CLAY: brown, grey, medium plasticity At 3.0m, as above but clay is high plasticity	M	St	ALLUVIUM
			▽ (4.50m)	4.50m SPT 10,10,6 N=16 4.95m	4.00m – 4.85m	SM	Silty SAND: grey, brown, medium to coarse grained sand, with clay	M	MD	
				6.00m SPT 4,5,7 N=12 6.45m	4.85m – 6.35m	CH	Silty CLAY: grey, brown, high plasticity, trace of sand	M	St	
				7.50m SPT 10,11,14 N=25 7.95m	6.35m – 8.0	CH	Silty CLAY: grey, high plasticity	M	St VSt	

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH6
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 17/5/16
DATE COMPLETED : 17/5/16
DATE LOGGED : 17/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS											
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E		9.00m D 9.50m	8.0 9.0		CH	Silty CLAY: grey, high plasticity *(continued)* 9.50m	M	VSt	ALLUVIUM
								End of borehole at 9.5m, borehole collapse.			9.50: SPT unable to be performed due to wall collapse. Refusal at 7.3m
					10.0 11.0 12.0 13.0 14.0 15.0 16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : A2-BH7
FILE / JOB NO : IA110700
SHEET : 1 OF 2

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 18/5/16
DATE COMPLETED : 19/5/16
DATE LOGGED : 19/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING

Depth (m)	Drilling & Casing	Water	Drilling Penetration	Ground Water Levels
0.0–0.5	HA			
0.5–8.0	AD/T		VE	Not Observed

Samples & Field Tests
0.50m SPT 6,5,5 N=10 0.95m
1.50m SPT 3,4,5 N=9 1.95m
3.00m SPT 3,3,6 N=9 3.45m
4.50m SPT 4,5,6 N=11 4.95m
6.00m SPT 5,7,10 N=17 6.45m
7.50m SPT 4,6,9 N=15 7.95m

MATERIAL

Depth (m)	Material Description Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	Classification Symbol	Moisture Condition	Consistency Relative Density	Structure & Other Observations
0.0–0.40m	Silty CLAY: brown, low to medium plasticity, with rootlets				FILL
0.40m	Silty CLAY: pale grey, medium plasticity, trace of rootlets	CI-CH	D	St	ALLUVIUM
0.9	At 0.9m, as above but grey, brown, clay is medium to high plasticity		M		
1.50m	Silty CLAY: grey, brown, high plasticity	CH			
6.00m	Silty CLAY: grey, high plasticity, trace of ironstone gravel	CH		VSt	
7.5–8.0				St	

See Explanatory Notes for details of abbreviations & basis of descriptions.

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JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH7
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 18/5/16
DATE COMPLETED : 19/5/16
DATE LOGGED : 19/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
AD/T		VE	Not Observed		8.0		CH	Silty CLAY: grey, high plasticity, trace of ironstone gravel *(continued)*	M	St	ALLUVIUM
		E						At 8.5m, as above but brown, grey		VSt	
					9.0						
				9.50m SPT 6,10,12 N=22 9.95m			9.95m				
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH8
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 18/5/16
DATE COMPLETED : 18/5/16
DATE LOGGED : 18/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING					MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
HA					0.0		Silty CLAY: brown, low plasticity, with rootlets			TOPSOIL
					0.10m		Silty CLAY: brown, pale brown, low plasticity, trace of rootlets	D		FILL
AD/T		VE		0.50m SPT 4,5,6 N=11 0.95m	0.50m	CI-CH	Silty CLAY: grey, brown, medium to high plasticity, trace of rootlets	D - M	St	ALLUVIUM
					1.0					
				1.50m SPT 3,4,6 N=10 1.95m			At 1.5m, as above but clay is high plasticity	M		
				2.00m U 2.50m	2.0					
				3.00m SPT 5,6,7 N=13 3.45m	3.00m	CH	Silty CLAY: grey, high plasticity			
					4.00m	SM	Silty SAND: grey, medium to coarse grained sand, with clay	M - W	MD	
			▽	4.50m SPT 9,6,8 N=14 4.95m						
					4.75m	CH	Silty CLAY: grey, high plasticity	M	St	
					5.0					
				6.00m SPT 4,7,8 N=15 6.45m	6.0					
					7.0					
				7.50m SPT 4,6,10 N=16 7.95m			At 7.5m, as above but trace of ironstone gravel			
					8.0					

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : A2-BH8
FILE / JOB NO : IA110700
SHEET : 2 OF 2

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 18/5/16
DATE COMPLETED : 18/5/16
DATE LOGGED : 18/5/16
LOGGED BY : MG
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
DRILLING & CASING	WATER										
AD/T		VE			8.0		CH	Silty CLAY: grey, high plasticity *(continued)*	M	St	ALLUVIUM
					9.0			9.50m			
				10.00m SPT 4,5,6 N=11 10.45m	10.0		CS	Sandy CLAY: grey, brown, high plasticity, medium to coarse grained sand, trace of ironstone gravel 10.45m			
								End of borehole at 10.45m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

SKM LIB 1.01.2.GLB Log IS AU BOREHOLE 2 IA110700 GINT.GPJ <<DrawingFile>> 14/06/2016 18:17 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: SKM 1.01.2 2013-10-17 Prj: SKM 1.01.1 2013-10-16

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH9
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 16/5/16
DATE COMPLETED : 16/5/16
DATE LOGGED : 16/5/16
LOGGED BY : MG/JK
CHECKED BY : JK

DEPTH (m)	DRILLING & CASING	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
0.0 – 0.10m	AD/T	VE				Silty SAND: pale brown, fine to medium grained sand, with rootlets	D		TOPSOIL
0.10m – 4.00m				0.50m SPT 5,7,8 N=15 0.95m 1.50m SPT 3,6,8 N=14 1.95m 3.00m SPT 4,6,10 N=16 3.45m	CI-CH	Silty CLAY: grey, red-brown, medium plasticity At 1.5m, as above but clay is high plasticity At 3.0m, as above but trace of fine gravel	D (to 3.0) M (3.0 – 4.0)	St	ALLUVIUM
3.0		E							
4.00m – 4.65m			▽ 4.50m	4.50m SPT 6,8,7 N=15 4.95m	SM	Silty SAND: grey, red-brown, medium to coarse grained sand, trace of clay	W	MD	
4.65m – 6.00m					CS	Sandy CLAY: grey, red-brown, high plasticity, medium to coarse grained sand	M	St	
6.00m – 7.00m				6.00m SPT 3,6,7 N=13 6.45m	CH	Silty CLAY: grey, high plasticity	M	St	
7.00m – 8.0				7.50m SPT 4,8,11 N=19 7.95m	CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel	M	VSt	

See Explanatory Notes for details of abbreviations & basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH9
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 16/5/16
DATE COMPLETED : 16/5/16
DATE LOGGED : 16/5/16
LOGGED BY : MG/JK
CHECKED BY : JK

DRILLING						MATERIAL					
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E			8.0		CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel *(continued)*	M	VSt	ALLUVIUM
				9.00m D 9.50m	9.0			9.00m			
				9.50m SPT 6,10,10 N=20 9.95m			SC	Clayey SAND: grey, red-brown, medium to coarse grained sand		MD	
								9.95m			
					10.0			End of borehole at 9.95m, target depth			
					11.0						
					12.0						
					13.0						
					14.0						
					15.0						
					16.0						

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH10
FILE / JOB NO : IA110700
SHEET : 1 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°

RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF

DATE STARTED : 16/5/16
DATE COMPLETED : 16/5/16
DATE LOGGED : 16/5/16
LOGGED BY : MG/JK
CHECKED BY : JK

DRILLING						MATERIAL				
PROGRESS										
DRILLING & CASING	WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		VE			0.0		Silty SAND: pale brown, fine to medium grained sand, with rootlets	D		TOPSOIL
					0.10m	CI-CH	Silty CLAY: grey, red-brown, medium to high plasticity	M	St	ALLUVIUM
				0.50m SPT 4,4,6 N=10 0.95m						
					1.0					
				1.50m SPT 2,4,6 N=10 1.95m						
					2.0					
							At 2.5m, as above but clay is high plasticity			
				3.00m SPT 5,7,8 N=15 3.45m	3.0					
		E			4.0					
			▽	4.50m SPT 4,8,12 N=20 4.95m						
					4.65m	SM	Silty SAND: pale grey, medium to coarse grained sand, trace of clay	W	MD	
					5.0					
				6.00m SPT 3,5,8 N=13 6.45m	6.0					
					6.20m	CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel	M	St	
					7.0					
				7.50m SPT 5,7,8 N=15 7.95m						
					8.0					

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

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JACOBS

NON-CORE DRILL HOLE - GEOLOGICAL LOG

PROJECT : Bankstown Airport - Geotechnical Investigation
LOCATION : Site 2

HOLE NO : A2-BH10
FILE / JOB NO : IA110700
SHEET : 2 OF 2

POSITION :
SURFACE ELEVATION :
ANGLE FROM HORIZONTAL : 90°
RIG TYPE : Geoprobe 7822DT
MOUNTING : Track
CONTRACTOR : Epoca Environmental
DRILLER : DF
DATE STARTED : 16/5/16
DATE COMPLETED : 16/5/16
DATE LOGGED : 16/5/16
LOGGED BY : MG/JK
CHECKED BY : JK

DRILLING						MATERIAL				
PROGRESS: DRILLING & CASING	PROGRESS: WATER	DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY RELATIVE DENSITY	STRUCTURE & Other Observations
AD/T		E		9.50m	8.0 9.0	CH	Silty CLAY: grey, red-brown, high plasticity, trace of ironstone gravel *(continued)* 9.50m	M	St	ALLUVIUM
				SPT 5,5,6 N=11 9.95m		CS	Sandy CLAY: grey, brown, medium plasticity, fine grained sand 9.95m			
					10.0 11.0 12.0 13.0 14.0 15.0 16.0		End of borehole at 9.95m, target depth			

See Explanatory Notes for
details of abbreviations
& basis of descriptions.

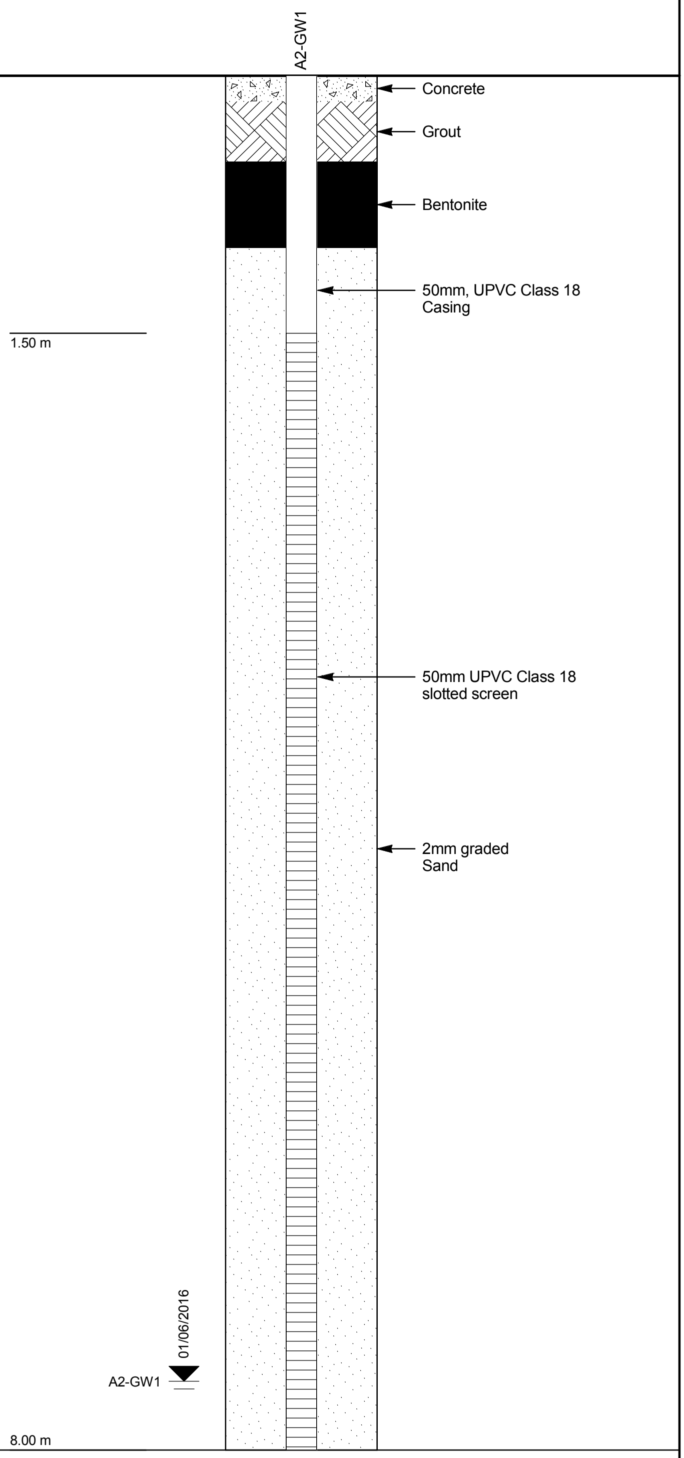
Hole ID **A2-GW1**

CLIENT	: Bankstown Airport Limited	POSITION	: Site 2	SHEET	: 1 OF 1
CONTRACTOR	: Epoca Environmental	EASTING	:	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	:	LOGGED BY	: MG
LOCATION	: Bankstown Airport	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 01/06/2016
PROJECT No.	: IA110700	GROUND RL	:		

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
A2-GW1	Standpipe Piezometer		8.00 m	01/06/2016	

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T					Silty CLAY: brown, low plasticity, with rootlets, dry (topsoil)
					Silty CLAY: brown, medium plasticity, trace of fine grained sand and rootlets, moist (fill)
		1			Clayey GRAVEL: grey, dark brown, fine to medium gravel, with clay, trace of fine to medium grained sand, moist (fill)
		2			Silty CLAY: brown, grey, high plasticity, moist (alluvial)
		3			From 3.0-3.5m, as above but trace of ironstone gravel
		4			
		5			Silty CLAY: grey, red-brown, high plasticity, with ironstone gravel, trace of fine to medium gravel, moist (alluvial)
		6			At 6.0m, as above but trace of fine grained sand
		7			Silty CLAY: grey, brown, high plasticity, moist (alluvial)
		8			End of borehole at 8.0m, target depth



RIG	:	CHECKED BY	: JK
INCLINATION	:	CHECKED DATE	: 09/06/2016
AZIMUTH	:	APPROVED BY	: SR
HOLE DIA.	:	APPROVED DATE	:

REMARK

JACOBS

Hole ID **A2-GW2**

CLIENT : Bankstown Airport Limited
CONTRACTOR : Epoca Environmental
PROJECT : Geotechnical Investigation
LOCATION : Bankstown Airport
PROJECT No. : IA110700

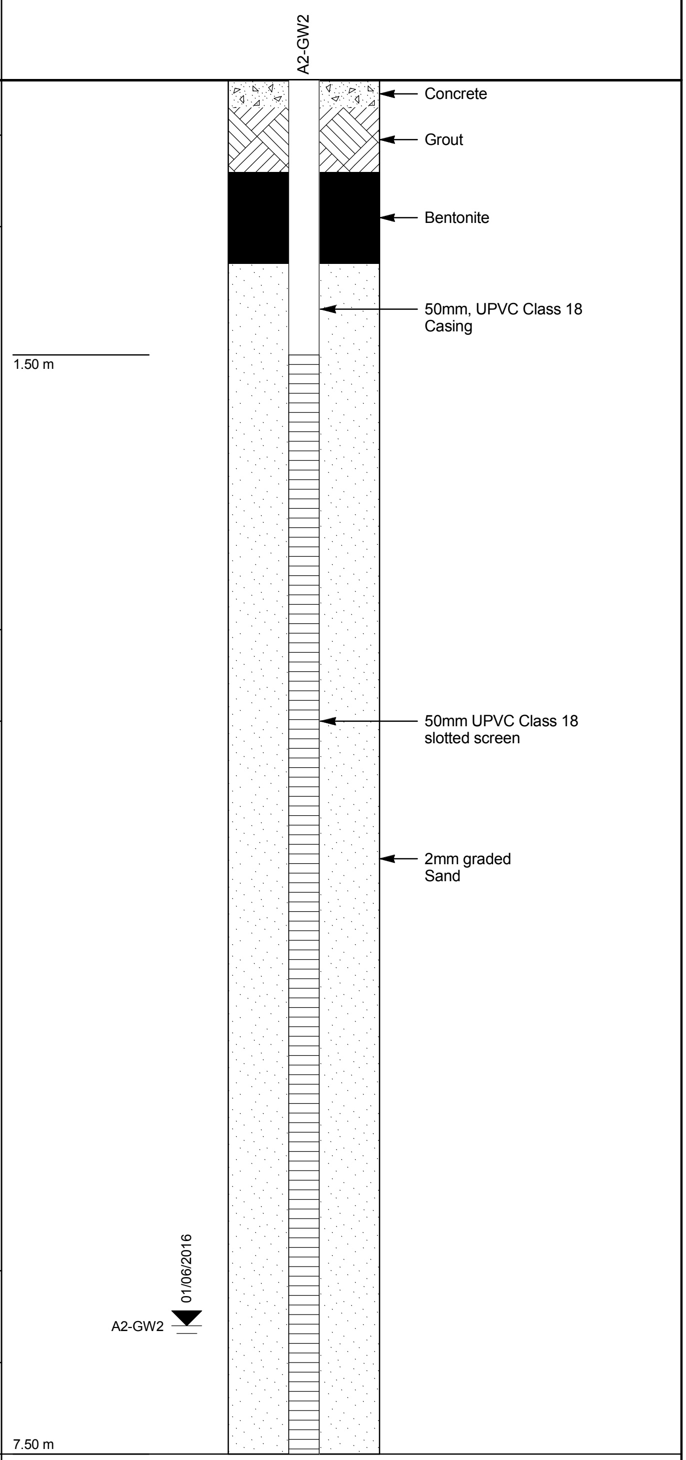
POSITION : Site 2
EASTING :
NORTHING :
COORD. SYS. : MGA94 Zone 56
GROUND RL :

SHEET : 1 OF 1
STATUS :
LOGGED BY : MG
DRILL DATE : 01/06/2016

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T					Silty CLAY: brown, pale brown, low plasticity, with rootlets, dry (topsoil)
					Silty CLAY: brown, medium plasticity, trace of rootlets, dry to moist (alluvial)
		1			Silty CLAY: grey, red-brown, high plasticity, moist (alluvial)
		2			
					At 2.5m, as above but trace of fine to medium grained sand
		3			Sandy CLAY: brown, high plasticity, fine to medium grained sand, moist (alluvial)
					Silty CLAY: grey, brown, high plasticity, moist (alluvial)
		4			
		5			From 5.0-6.5m, as above but grey, red-brown, with ironstone gravel
		6			
					Sandy CLAY: grey, brown, high plasticity, medium to coarse grained sand, moist (alluvial)
		7			Clayey SAND: red-brown, medium to coarse grained sand, moist to wet (alluvial)
		8			End of borehole at 7.5m, target depth

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
A2-GW2	Standpipe Piezometer		7.50 m	01/06/2016	



RIG :
INCLINATION :
AZIMUTH :
HOLE DIA. :

CHECKED BY : JK
CHECKED DATE : 09/06/2016
APPROVED BY : SR
APPROVED DATE :

REMARK

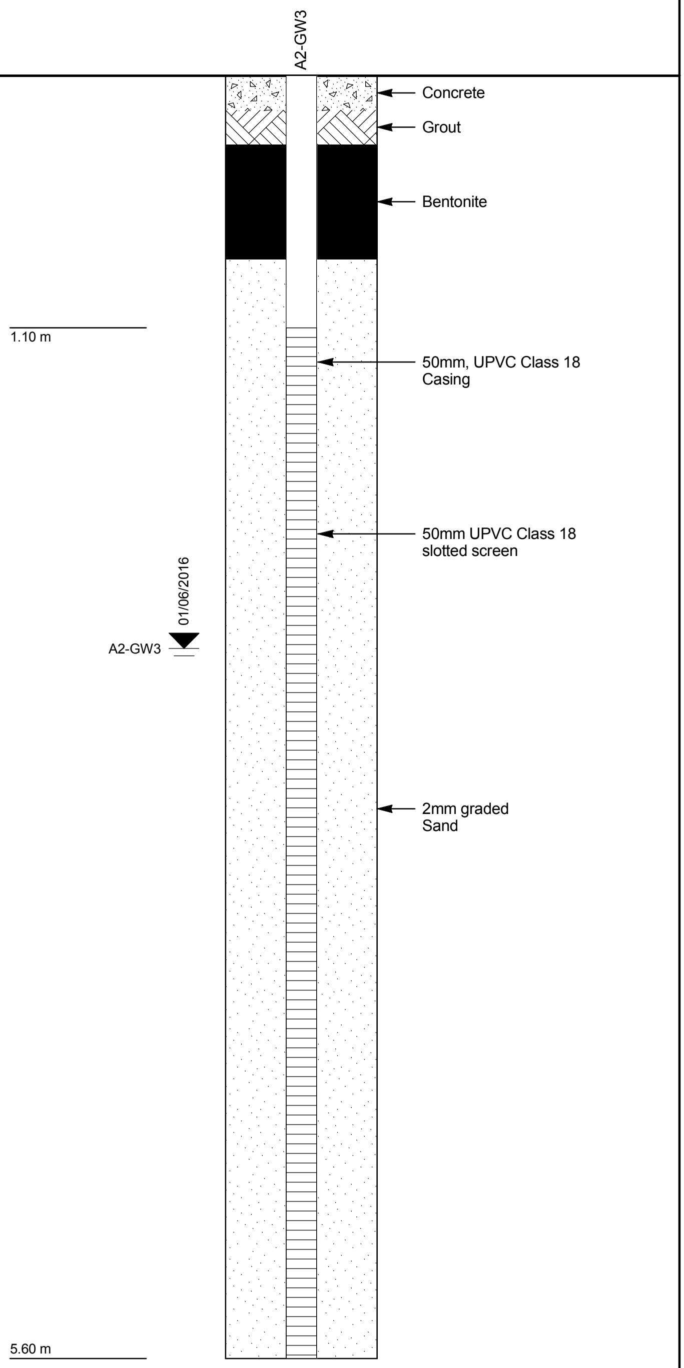
Hole ID **A2-GW3**

CLIENT	: Bankstown Airport Limited	POSITION	: Site 2	SHEET	: 1 OF 1
CONTRACTOR	: Epoca Environmental	EASTING	:	STATUS	:
PROJECT	: Geotechnical Investigation	NORTHING	:	LOGGED BY	: MG
LOCATION	: Bankstown Airport	COORD. SYS.	: MGA94 Zone 56	DRILL DATE	: 01/06/2016
PROJECT No.	: IA110700	GROUND RL	:		

PIEZOMETER CONSTRUCTION DETAILS

ID	Type	Stick Up & RL	Tip Depth & RL	Installation Date	Static Water Level
A2-GW3	Standpipe Piezometer		5.60 m	01/06/2016	

Method	Drilling Water	Depth (m)	Elevation (m AHD)	Graphic Log	Soil / Rock Description
AD/T					Silty CLAY: brown, pale grey, low plasticity, with fine to medium gravel and rootlets, dry (topsoil)
					Silty CLAY: brown, pale grey, low plasticity, trace of rootlets, dry (alluvium)
					Silty CLAY: brown, orange-brown, medium to high plasticity, dry to moist (alluvium)
		1			Silty CLAY: grey, red-brown, high plasticity, moist (alluvium)
		2			
		3			
					Sandy CLAY: grey, high plasticity, medium grained sand, moist to wet (alluvium)
	▽	4			Clayey SAND: red-brown, medium to coarse grained sand, moist to wet (alluvium)
					Silty CLAY: grey, high plasticity, moist (alluvium)
		5			
		6			End of borehole at 6.0m, target depth



RIG	:	CHECKED BY	: JK
INCLINATION	:	CHECKED DATE	: 09/06/2016
AZIMUTH	:	APPROVED BY	: SR
HOLE DIA.	:	APPROVED DATE	:

REMARK

Appendix C – Groundwater Field Data Sheets

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : AZ-GW1 **JACOBS**

Project No : IA110700 **Project Name :** Bankstown Airport - Site 2

Gauging

Date :
Performed By :
Gauging Method :
Well Diameter :
Time :
Bore Depth :
LNAPL Present : Y / N
SWL :
Depth to LNAPL :
(If yes, thickness) :
Comments :
DNAPL Present : Y / N
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / N
Photo Number :

Purging / Development

Date : 16/05/16
Performed By : BC
Well Diameter : 50mm
Purge Method : Submersible Pump
Time Started : 955
SWL (start) : 7.015
Volume Removed : 3.5L
Bore Depth (start) : 7.975
Time Stopped : 1035
SWL (end) : Dry
Discharge Rate :
Bore Depth (end) :
Comments : light brown, highly turbid, no odour/sheen
light brown, mod-high turbidity, no odour/sheen.
NAPL Present : Y / [✓ N]
(If yes, thickness) :

Sampling

Date : 20/06/16
Performed By : BC
Well Diameter : 50mm
Sampling Method : Peristaltic Pump.
Sampling Depth : ~7.9
Time Started : 1241
SWL (start) : 7.561
Time Stopped : 1405
SWL (end) : Dry.
Tubing Type : LDPE
Comments : Water quality parameters taken after sampling
Duplicate Sample Collected? Y / [✓ N]
Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (ppm)		SWL (m)	Comments (colour, turbidity, odours, sheen etc)
							~~(mg/L)~~ % Sat		
1400	0.1	15403	7.05	18.7	81.3	4.42	50.2		Very light brown, low turbidity, no odour, no sheen
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
______ m (-) ______ (=) ______

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
______ (X) ______ (=) 1.88 L

5.64 L

IS160614-16
78

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : A2-GW2 **JACOBS**

Project No : IA110700 **Project Name :** Bankstown Airport - Site 2

Gauging

Date : Performed By :
Gauging Method : Well Diameter :
Time : Bore Depth : LNAPL Present : Y / N
SWL : Depth to LNAPL : (If yes, thickness) :
Comments : DNAPL Present : Y / N
(If yes, thickness) :
Maintainance required : Visual confirmation with bailer : Y / N
Photo Number :

Purging / Development

Date : 16/05/16 Performed By : BC Well Diameter : 50mm
Purge Method : Submersible Pump
Time Started : 1420 SWL (start) : 2.422 Volume Removed : 25L Bore Depth (start) : 7.551
Time Stopped : 1505 SWL (end) : Dry Discharge Rate : Bore Depth (end) :
Comments : Brown, highly turbid, no odour, no sheen NAPL Present : Y / [✓ N]
Brown, mod-highly turbid (If yes, thickness) :

Sampling

Date : 20/06/16 Performed By : BC Well Diameter : 50mm
Sampling Method : Perastaltic pump.
Time Started : 1418 Sampling Depth : ~7.05 m
Time Stopped : 1520 SWL (start) : 3.908
Tubing Type : LDPE SWL (end) : 4.287
Comments :

Duplicate Sample Collected? Y / [✓ N] Duplicate Sample ID :

Field Analyses

Time	Volume Removed (L)	EC (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved Oxygen (ppm)	~~mg/L~~ % Sat	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
1422	0.1	21211	6.47	19.4	72.3	2.31	27.3	3.996	Clear/transparent, v. light brown tinge, no odour, no sheen
1428	0.5	21134	5.72	19.1	101.9	2.12	24.9	4.084	
1434	1.0	20927	5.63	18.7	109.8	2.27	26.5	4.148	
1440	1.5	20997	5.57	19.1	115.4	[illegible]	29.1	4.237	
1446	2.0	21191	5.56	19.4	116.6	2.26	26.6	4.272	Clear/transparent, v. light brown tinge no odour, no sheen.
1452	2.5	21157	5.55	19.3	116.4	2.32	27.4	4.279	
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
m (-) (=)

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
(X) (=) 10.05 L

30.2 L

WELL DEVELOPMENT, GAUGING AND SAMPLING DATA SHEET

WELL No : A2-GW3

JACOBS

Project No : TA110700
Project Name : Bankstown Airport - Site 2

Gauging

Date :
Performed By :
Gauging Method :
Well Diameter :
Time :
Bore Depth :
LNAPL Present : Y / N
SWL :
Depth to LNAPL :
(If yes, thickness) :
Comments :
DNAPL Present : Y / N
(If yes, thickness) :
Maintainance required :
Visual confirmation with bailer : Y / N
Photo Number :

Purging / Development

Date : 16/05/16
Performed By : BC
Well Diameter : 50mm
Purge Method : Submersible Pump
Time Started : 1335
SWL (start) : 2.270
Volume Removed : 37L
Bore Depth (start) : 5.552
Time Stopped : 1410
SWL (end) : Dry.
Discharge Rate :
Bore Depth (end) : 5.547
Comments : Red/brown, v. highly turbid, no odour/sheen
Red/brown, high-mod turbidity, no odour/sheen
NAPL Present : Y / [✓ N]
(If yes, thickness) :

Sampling

Date : 21/06/16
Performed By : BC
Well Diameter : 50mm
Sampling Method : Perastaltic pump
Time Started : 735
Sampling Depth : ~5.0 m
Time Stopped : 840
SWL (start) : 2.146
Tubing Type : LDPE
SWL (end) : 2.255
Comments :

Duplicate Sample Collected? [✓ Y] / N
Duplicate Sample ID : A2-QC09

Field Analyses

Time	Volume Removed (L)	Ec (uS/cm)	pH	Temp (C)	Redox (mV)	Dissolved oxygen (ppm)	Dissolved oxygen ~~(mg/L)~~ % Sat	SWL (m)	Comments (colour, turbidity, odours, sheen etc)
740	0.1	18085	4.74	17.2	149.9	3.06	34.4	2.174	Clear/transparent, v. low turbidity,
745	0.5	18366	4.50	17.4	200.6	2.78	31.8	2.208	no odour, no sheen
750	1.0	18455	4.47	17.3	213.7	2.81	31.7	2.226	
755	1.5	18497	4.46	17.5	224.4	2.87	32.5	2.242	Clear/transparent, v. low turbidity,
800	2.0	18540	4.43	17.5	230.8	2.84	32.1	2.247	no odour, no sheen.
Stabilisation Criteria		+/- 3%	+/- 0.05		+/- 10mV	+/- 10%			

Well Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

TOTAL WELL DEPTH (-) WATER LEVEL (=) *WATER COLUMN*
________ m (-) ________ (=) ________

WATER COLUMN (X) CONVERSION FACTOR (=) LITRES PER WELL VOLUME
________ (X) ________ (=) 5.59 L

16.8 L

Appendix D – Calibration Certificate

17/6/16

Multi Parameter Water Meter

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Instrument YSI Quatro Pro Plus
Serial No. 12D100012

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		NH1818	pH 7.02
2. pH 4.00		pH 4.00		NF1636	pH 4.09
3. pH 10.00		pH 10.00		NH1870	pH 10.09
4. mV		228.5mV		NH1934/NH1935	228.6mV
5. EC		2.76mS		NF2056	2.76mS
6. D.O		0.00ppm		4005	0.00ppm
7. Temp		22.7°C		MultiTherm	22.5°C

Calibrated by: Lin Wang

Calibration date: 17/06/2016

Next calibration due: 17/07/2016

Appendix E – Laboratory Certificates

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention: **Blair Cummings**

Report **501183-S**
Project name BANKSTOWN AIRPORT - SITE 2
Project ID IA110700
Received Date May 18, 2016

Client Sample ID			**A2_TP07_0.0**	**A2_TP07_0.5**	**A2_TP08_0.3**	**A2_TP22_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My19681**	**S16-My19683**	**S16-My19685**	**S16-My19686**
Date Sampled			**May 16, 2016**	**May 16, 2016**	**May 16, 2016**	**May 16, 2016**
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	%	81	74	78	78
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP07_0.0** **Soil** **S16-My19681** **May 16, 2016**	**A2_TP07_0.5** **Soil** **S16-My19683** **May 16, 2016**	**A2_TP08_0.3** **Soil** **S16-My19685** **May 16, 2016**	**A2_TP22_0.0** **Soil** **S16-My19686** **May 16, 2016**
Polycyclic Aromatic Hydrocarbons						
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	%	98	88	97	103
p-Terphenyl-d14 (surr.)	1	%	104	95	106	107
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	-	< 0.2
Toxaphene	1	mg/kg	< 1	-	-	< 1
Dibutylchlorendate (surr.)	1	%	87	-	-	112
Tetrachloro-m-xylene (surr.)	1	%	83	-	-	95
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	87	-	-	112
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	< 0.005	-	-	^{N09}0.006
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	-	< 0.01
13C-PFHxA (surr.)	1	%	94	-	-	105
13C8-PFOS (surr.)	1	%	101	-	-	108

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP07_0.0** **Soil** **S16-My19681** **May 16, 2016**	**A2_TP07_0.5** **Soil** **S16-My19683** **May 16, 2016**	**A2_TP08_0.3** **Soil** **S16-My19685** **May 16, 2016**	**A2_TP22_0.0** **Soil** **S16-My19686** **May 16, 2016**
% Moisture	1	%	16	25	18	20
Heavy Metals						
Arsenic	2	mg/kg	3.2	6.0	2.4	7.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.8
Chromium	5	mg/kg	8.0	19	6.6	13
Copper	5	mg/kg	13	8.8	< 5	9.1
Lead	5	mg/kg	32	8.1	11	35
Mercury	0.05	mg/kg	0.17	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	5.4	< 5	< 5	5.6
Zinc	5	mg/kg	37	< 5	< 5	23

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP22_0.5** **Soil** **S16-My19688** **May 16, 2016**	**A2_TP23_0.0** **Soil** **S16-My19689** **May 16, 2016**	**A2_TP23_0.2** **Soil** **S16-My19690** **May 16, 2016**	**A2_BH10_0.5** **Soil** **S16-My19691** **May 16, 2016**
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	79	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	79	< 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	%	80	78	71	79
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP22_0.5** **Soil** **S16-My19688** **May 16, 2016**	**A2_TP23_0.0** **Soil** **S16-My19689** **May 16, 2016**	**A2_TP23_0.2** **Soil** **S16-My19690** **May 16, 2016**	**A2_BH10_0.5** **Soil** **S16-My19691** **May 16, 2016**
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	94	85	94
p-Terphenyl-d14 (surr.)	1	%	105	102	87	103
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Dibutylchlorendate (surr.)	1	%	-	108	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	94	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	108	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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 **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP22_0.5** **Soil** **S16-My19688** **May 16, 2016**	**A2_TP23_0.0** **Soil** **S16-My19689** **May 16, 2016**	**A2_TP23_0.2** **Soil** **S16-My19690** **May 16, 2016**	**A2_BH10_0.5** **Soil** **S16-My19691** **May 16, 2016**
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	< 0.005	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	< 0.005	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	< 0.01	-	-
13C-PFHxA (surr.)	1	%	-	94	-	-
13C8-PFOS (surr.)	1	%	-	94	-	-
% Moisture	1	%	22	15	17	18
Heavy Metals						
Arsenic	2	mg/kg	4.7	3.5	3.8	5.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	9.1	11	13
Copper	5	mg/kg	7.1	15	6.0	12
Lead	5	mg/kg	8.8	41	16	13
Mercury	0.05	mg/kg	< 0.05	0.10	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	6.7	< 5	< 5
Zinc	5	mg/kg	< 5	38	12	< 5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH9_0.0** **Soil** **S16-My19692** **May 16, 2016**	**A2_BH5_0.5** **Soil** **S16-My19693** **May 16, 2016**	**A2_BH3_1.5** **Soil** **S16-My19694** **May 17, 2016**	**A2_BH2_0.0** **Soil** **S16-My19695** **May 17, 2016**
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	%	82	76	85	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH9_0.0** **Soil** **S16-My19692** **May 16, 2016**	**A2_BH5_0.5** **Soil** **S16-My19693** **May 16, 2016**	**A2_BH3_1.5** **Soil** **S16-My19694** **May 17, 2016**	**A2_BH2_0.0** **Soil** **S16-My19695** **May 17, 2016**
Polycyclic Aromatic Hydrocarbons						
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	94	91	103
p-Terphenyl-d14 (surr.)	1	%	98	96	94	106
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
% Moisture	1	%	8.8	12	18	5.0
Heavy Metals						
Arsenic	2	mg/kg	5.0	4.7	4.0	< 2
Cadmium	0.4	mg/kg	< 0.4	1.7	< 0.4	< 0.4
Chromium	5	mg/kg	9.6	12	8.6	< 5
Copper	5	mg/kg	6.4	< 5	14	< 5
Lead	5	mg/kg	22	12	12	7.5
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	15	200	5.2	< 5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH6_0.5** **Soil** **S16-My19696** **May 17, 2016**	**A2_TP03_0.3** **Soil** **S16-My19697** **May 17, 2016**	**A2_TP04_0.0** **Soil** **S16-My19698** **May 17, 2016**	**A2_TP04_0.5** **Soil** **S16-My19699** **May 17, 2016**
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

Client Sample ID			**A2_BH6_0.5**	**A2_TP03_0.3**	**A2_TP04_0.0**	**A2_TP04_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My19696**	**S16-My19697**	**S16-My19698**	**S16-My19699**
Date Sampled			**May 17, 2016**	**May 17, 2016**	**May 17, 2016**	**May 17, 2016**
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	83	80	78
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	92	97	106	94
p-Terphenyl-d14 (surr.)	1	%	95	101	110	98
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH6_0.5** **Soil** **S16-My19696** **May 17, 2016**	**A2_TP03_0.3** **Soil** **S16-My19697** **May 17, 2016**	**A2_TP04_0.0** **Soil** **S16-My19698** **May 17, 2016**	**A2_TP04_0.5** **Soil** **S16-My19699** **May 17, 2016**
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	-	101	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	99	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	101	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	< 0.005	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	< 0.01	-
13C-PFHxA (surr.)	1	%	-	-	108	-
13C8-PFOS (surr.)	1	%	-	-	120	-
% Moisture	1	%	18	5.2	14	21
Heavy Metals						
Arsenic	2	mg/kg	5.8	3.9	4.9	4.3
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	5.4	17	17
Copper	5	mg/kg	9.3	< 5	12	6.6
Lead	5	mg/kg	9.3	10	27	12
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	9.6	< 5
Zinc	5	mg/kg	< 5	< 5	30	< 5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP05_0.0** **Soil** **S16-My19700** **May 17, 2016**	**A2_TP06_0.0** **Soil** **S16-My19701** **May 16, 2016**	**A2_TP06_0.2** **Soil** **S16-My19702** **May 16, 2016**	**A2_TP18_0.0** **Soil** **S16-My19703** **May 17, 2016**
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	60
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	96
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	156
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	%	78	82	82	80
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	94	102	96	96
p-Terphenyl-d14 (surr.)	1	%	93	102	95	95
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05

Client Sample ID			A2_TP05_0.0	A2_TP06_0.0	A2_TP06_0.2	A2_TP18_0.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My19700**	**S16-My19701**	**S16-My19702**	**S16-My19703**
Date Sampled			**May 17, 2016**	**May 16, 2016**	**May 16, 2016**	**May 17, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	-	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	-	98	-	109
Tetrachloro-m-xylene (surr.)	1	%	-	99	-	88
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	98	-	109
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	140
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	< 0.005	-	^{N09}0.005
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	< 0.005	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	< 0.01	-	< 0.01
13C-PFHxA (surr.)	1	%	-	99	-	148
13C8-PFOS (surr.)	1	%	-	92	-	116
% Moisture	1	%	18	10	4.6	14
Heavy Metals						
Arsenic	2	mg/kg	6.2	10	2.0	3.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	10	32	7.8	10
Copper	5	mg/kg	5.5	6.0	< 5	7.7
Lead	5	mg/kg	20	28	14	23
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.07
Nickel	5	mg/kg	< 5	5.6	< 5	5.4
Zinc	5	mg/kg	8.7	22	6.3	33

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP21_0.0** **Soil** **S16-My19705** **May 17, 2016**	**A2_TP21_0.2** **Soil** **S16-My19706** **May 17, 2016**	**A2_TP17_0.0** **Soil** **S16-My19707** **May 18, 2016**	**A2_TP17_2.5** **Soil** **S16-My19708** **May 18, 2016**
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	%	78	77	80	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.1	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.4	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	0.7	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	0.6	< 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	0.6	< 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	2.0	< 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	1.2	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	1.9	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	7	< 0.5
2-Fluorobiphenyl (surr.)	1	%	98	94	91	94
p-Terphenyl-d14 (surr.)	1	%	100	95	93	98
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID			**A2_TP21_0.0**	**A2_TP21_0.2**	**A2_TP17_0.0**	**A2_TP17_2.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My19705**	**S16-My19706**	**S16-My19707**	**S16-My19708**
Date Sampled			**May 17, 2016**	**May 17, 2016**	**May 18, 2016**	**May 18, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	110	-	94	-
Tetrachloro-m-xylene (surr.)	1	%	91	-	86	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	110	-	94	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	< 0.005	-	< 0.005	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	< 0.01	-
13C-PFHxA (surr.)	1	%	133	-	106	-
13C8-PFOS (surr.)	1	%	118	-	124	-
% Clay	1	%	-	-	-	58
Conductivity (1:5 aqueous extract at 25°C)	5	uS/cm	-	-	-	990
pH (units)(1:5 soil:CaCl2 extract)	0.1	pH Units	-	-	-	7.2
% Moisture	1	%	13	10	7.2	21
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	16
Heavy Metals						
Arsenic	2	mg/kg	4.1	4.4	9.4	3.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.5	< 0.4
Chromium	5	mg/kg	11	17	18	6.6
Copper	5	mg/kg	5.6	5.8	11	15
Lead	5	mg/kg	17	7.9	61	15
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP21_0.0** **Soil** **S16-My19705** **May 17, 2016**	**A2_TP21_0.2** **Soil** **S16-My19706** **May 17, 2016**	**A2_TP17_0.0** **Soil** **S16-My19707** **May 18, 2016**	**A2_TP17_2.5** **Soil** **S16-My19708** **May 18, 2016**
Heavy Metals						
Nickel	5	mg/kg	< 5	< 5	6.0	< 5
Zinc	5	mg/kg	13	5.6	49	14

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH7_0.0** **Soil** **S16-My19709** **May 18, 2016**	**A2_BH8_0.5** **Soil** **S16-My19710** **May 18, 2016**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	77	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5

Client Sample ID			**A2_BH7_0.0**	**A2_BH8_0.5**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My19709**	**S16-My19710**
Date Sampled			**May 18, 2016**	**May 18, 2016**
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
2-Fluorobiphenyl (surr.)	1	%	87	98
p-Terphenyl-d14 (surr.)	1	%	90	103
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
% Moisture	1	%	5.1	19
Heavy Metals				
Arsenic	2	mg/kg	2.0	5.6
Cadmium	0.4	mg/kg	0.8	< 0.4
Chromium	5	mg/kg	10	17
Copper	5	mg/kg	8.8	9.9
Lead	5	mg/kg	21	9.0
Mercury	0.05	mg/kg	< 0.05	< 0.05
Nickel	5	mg/kg	8.6	< 5
Zinc	5	mg/kg	33	6.5

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	Sydney	May 20, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	May 20, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 20, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	May 20, 2016	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 20, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	May 20, 2016	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Sydney	May 20, 2016	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	May 20, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
PFOS/PFOA/6:2FTS	Brisbane	May 20, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
% Clay	Brisbane	May 20, 2016	6 Day
- Method: LTM-GEN-7040			
pH (units)(1:5 soil:CaCl2 extract)	Sydney	May 23, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C)	Sydney	May 20, 2016	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	May 23, 2016	
% Moisture	Sydney	May 19, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 18, 2016 7:20 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501183	**Due:**	May 26, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Blair Cummings
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	A2_TP07_0.0	May 16, 2016		Soil	S16-My19681						X	X	X		X
2	A2_TP07_0.1	May 16, 2016		Soil	S16-My19682		X								
3	A2_TP07_0.5	May 16, 2016		Soil	S16-My19683								X		X
4	A2_TP08_0.0	May 16, 2016		Soil	S16-My19684		X								
5	A2_TP08_0.3	May 16, 2016		Soil	S16-My19685								X		X
6	A2_TP22_0.0	May 16, 2016		Soil	S16-My19686						X	X	X		X
7	A2_TP22_0.2	May 16, 2016		Soil	S16-My19687		X								
8	A2_TP22_0.5	May 16, 2016		Soil	S16-My19688								X		X
9	A2_TP23_0.0	May 16, 2016		Soil	S16-My19689						X	X	X		X
10	A2_TP23_0.2	May 16, 2016		Soil	S16-My19690		X						X		X

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 501183
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 18, 2016 7:20 PM
Due: May 26, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
11	A2_BH10_0.5	May 16, 2016		Soil	S16-My19691								X		X
12	A2_BH9_0.0	May 16, 2016		Soil	S16-My19692								X		X
13	A2_BH5_0.5	May 16, 2016		Soil	S16-My19693								X		X
14	A2_BH3_1.5	May 17, 2016		Soil	S16-My19694								X		X
15	A2_BH2_0.0	May 17, 2016		Soil	S16-My19695								X		X
16	A2_BH6_0.5	May 17, 2016		Soil	S16-My19696								X		X
17	A2_TP03_0.3	May 17, 2016		Soil	S16-My19697								X		X
18	A2_TP04_0.0	May 17, 2016		Soil	S16-My19698		X				X	X	X		X
19	A2_TP04_0.5	May 17, 2016		Soil	S16-My19699								X		X
20	A2_TP05_0.0	May 17, 2016		Soil	S16-My19700								X		X
21	A2_TP06_0.0	May 16, 2016		Soil	S16-My19701						X	X	X		X

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Order No.: IA110700
Report #: 501183
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 18, 2016 7:20 PM
Due: May 26, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
22	A2_TP06_0.2	May 16, 2016		Soil	S16-My19702		X						X		X
23	A2_TP18_0.0	May 17, 2016		Soil	S16-My19703						X	X	X		X
24	A2_TP18_0.3	May 17, 2016		Soil	S16-My19704		X								
25	A2_TP21_0.0	May 17, 2016		Soil	S16-My19705						X	X	X		X
26	A2_TP21_0.2	May 17, 2016		Soil	S16-My19706		X						X		X
27	A2_TP17_0.0	May 18, 2016		Soil	S16-My19707		X				X	X	X		X
28	A2_TP17_2.5	May 18, 2016		Soil	S16-My19708	X				X			X	X	X
29	A2_BH7_0.0	May 18, 2016		Soil	S16-My19709								X		X
30	A2_BH8_0.5	May 18, 2016		Soil	S16-My19710								X		X
31	A2_TP07_1.0	May 16, 2016		Soil	S16-My19711				X						
32	A2_TP07_2.0	May 16, 2016		Soil	S16-My19712				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
33	A2_TP07_2.5	May 16, 2016		Soil	S16-My19713				X						
34	A2_TP08_0.5	May 16, 2016		Soil	S16-My19714				X						
35	A2_TP08_1.0	May 16, 2016		Soil	S16-My19715				X						
36	A2_TP08_2.0	May 16, 2016		Soil	S16-My19716				X						
37	A2_TP08_2.5	May 16, 2016		Soil	S16-My19717				X						
38	A2_TP22_1.0	May 16, 2016		Soil	S16-My19718				X						
39	A2_TP23_0.5	May 16, 2016		Soil	S16-My19719				X						
40	A2_TP23_1.0	May 16, 2016		Soil	S16-My19720				X						
41	A2_TP23_1.0	May 16, 2016		Soil	S16-My19721			X							
42	A2_TP23_2.5	May 16, 2016		Soil	S16-My19722				X						
43	A2_BH10_0.0	May 16, 2016		Soil	S16-My19723				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
44	A2_BH10_1.5	May 16, 2016		Soil	S16-My19724				X						
45	A2_BH9_0.5	May 16, 2016		Soil	S16-My19725				X						
46	A2_BH9_1.5	May 16, 2016		Soil	S16-My19726				X						
47	A2_BH5_0.0	May 16, 2016		Soil	S16-My19727				X						
48	A2_BH5_1.5	May 16, 2016		Soil	S16-My19728				X						
49	A2_BH3_0.0	May 17, 2016		Soil	S16-My19729				X						
50	A2_BH3_0.5	May 17, 2016		Soil	S16-My19730				X						
51	A2_BH2_0.5	May 17, 2016		Soil	S16-My19731				X						
52	A2_BH2_1.5	May 17, 2016		Soil	S16-My19732				X						
53	A2_BH6_0.0	May 17, 2016		Soil	S16-My19733				X						
54	A2_BH6_1.5	May 17, 2016		Soil	S16-My19734				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
55	A2_TP03_0.0	May 17, 2016		Soil	S16-My19735				X						
56	A2_TP03_0.5	May 17, 2016		Soil	S16-My19736				X						
57	A2_TP03_1.0	May 17, 2016		Soil	S16-My19737				X						
58	A2_TP04_0.2	May 17, 2016		Soil	S16-My19738				X						
59	A2_TP04_1.0	May 17, 2016		Soil	S16-My19739				X						
60	A2_TP05_0.3	May 17, 2016		Soil	S16-My19740				X						
61	A2_TP05_0.5	May 17, 2016		Soil	S16-My19741				X						
62	A2_TP05_1.0	May 17, 2016		Soil	S16-My19742				X						
63	A2_TP05_2.0	May 17, 2016		Soil	S16-My19743				X						
64	A2_TP05_2.5	May 17, 2016		Soil	S16-My19744				X						
65	A2_TP06_0.5	May 17, 2016		Soil	S16-My19745				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
66	A2_TP06_1.0	May 17, 2016		Soil	S16-My19746				X						
67	A2_TP06_2.0	May 17, 2016		Soil	S16-My19747				X						
68	A2_TP06_2.5	May 17, 2016		Soil	S16-My19748				X						
69	A2_TP21_0.5	May 17, 2016		Soil	S16-My19749				X						
70	A2_TP21_1.0	May 17, 2016		Soil	S16-My19750				X						
71	A2_TP17_0.5	May 18, 2016		Soil	S16-My19751				X						
72	A2_TP17_1.0	May 18, 2016		Soil	S16-My19752				X						
73	A2_TP17_2.0	May 18, 2016		Soil	S16-My19753				X						
74	A2_BH7_0.5	May 18, 2016		Soil	S16-My19754				X						
75	A2_BH7_1.5	May 18, 2016		Soil	S16-My19755				X						
76	A2_BH8_0.0	May 18, 2016		Soil	S16-My19756				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
77	A2_BH8_1.5	May 18, 2016		Soil	S16-My19757				X						
78	A2_TP23_2.0	May 16, 2016		Soil	S16-My20037				X						
Test Counts						1	9	1	47	1	8	8	26	1	26

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%.

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	
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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C)	uS/cm	< 5			5	Pass	
Method Blank							
Ion Exchange Properties							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	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	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	94			70-130	Pass	
TRH C10-C14	%	117			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	91			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	119			70-130	Pass	
TRH C6-C10	%	86			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	95			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	98			70-130	Pass	
Benz(a)anthracene	%	100			70-130	Pass	
Benzo(a)pyrene	%	84			70-130	Pass	
Benzo(b&j)fluoranthene	%	104			70-130	Pass	
Benzo(g.h.i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	91			70-130	Pass	
Chrysene	%	106			70-130	Pass	
Dibenz(a.h)anthracene	%	81			70-130	Pass	
Fluoranthene	%	94			70-130	Pass	
Fluorene	%	91			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	82			70-130	Pass	
Naphthalene	%	96			70-130	Pass	
Phenanthrene	%	96			70-130	Pass	
Pyrene	%	93			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	109			70-130	Pass	
4.4'-DDD	%	112			70-130	Pass	
4.4'-DDE	%	111			70-130	Pass	
4.4'-DDT	%	120			70-130	Pass	
a-BHC	%	109			70-130	Pass	
Aldrin	%	114			70-130	Pass	
b-BHC	%	105			70-130	Pass	
d-BHC	%	113			70-130	Pass	
Dieldrin	%	110			70-130	Pass	
Endosulfan I	%	115			70-130	Pass	
Endosulfan II	%	113			70-130	Pass	
Endosulfan sulphate	%	113			70-130	Pass	
Endrin	%	111			70-130	Pass	
Endrin aldehyde	%	112			70-130	Pass	
Endrin ketone	%	110			70-130	Pass	
g-BHC (Lindane)	%	109			70-130	Pass	
Heptachlor	%	118			70-130	Pass	
Heptachlor epoxide	%	108			70-130	Pass	
Hexachlorobenzene	%	113			70-130	Pass	
Methoxychlor	%	101			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	97			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	115			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	99			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	100			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)			%	110			50-150	Pass	
LCS - % Recovery									
% Clay			%	105			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	98			70-130	Pass	
Cadmium			%	106			70-130	Pass	
Chromium			%	104			70-130	Pass	
Copper			%	82			70-130	Pass	
Lead			%	95			70-130	Pass	
Mercury			%	103			70-130	Pass	
Nickel			%	98			70-130	Pass	
Zinc			%	84			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-My19681	CP	%	95			70-130	Pass	
4.4'-DDD	S16-My23468	NCP	%	120			70-130	Pass	
4.4'-DDE	S16-My19681	CP	%	100			70-130	Pass	
4.4'-DDT	S16-My19681	CP	%	80			70-130	Pass	
a-BHC	S16-My19681	CP	%	91			70-130	Pass	
Aldrin	S16-My19681	CP	%	94			70-130	Pass	
b-BHC	S16-My19681	CP	%	88			70-130	Pass	
d-BHC	S16-My19681	CP	%	98			70-130	Pass	
Dieldrin	S16-My19681	CP	%	106			70-130	Pass	
Endosulfan I	S16-My19681	CP	%	101			70-130	Pass	
Endosulfan II	S16-My19681	CP	%	107			70-130	Pass	
Endosulfan sulphate	S16-My19681	CP	%	113			70-130	Pass	
Endrin	S16-My19681	CP	%	96			70-130	Pass	
Endrin aldehyde	S16-My19681	CP	%	111			70-130	Pass	
Endrin ketone	S16-My19681	CP	%	129			70-130	Pass	
g-BHC (Lindane)	S16-My19681	CP	%	92			70-130	Pass	
Heptachlor	S16-My19681	CP	%	100			70-130	Pass	
Heptachlor epoxide	S16-My19681	CP	%	98			70-130	Pass	
Hexachlorobenzene	S16-My19681	CP	%	92			70-130	Pass	
Methoxychlor	S16-My19681	CP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My19681	CP	%	90			70-130	Pass	
Cadmium	S16-My19681	CP	%	93			70-130	Pass	
Chromium	S16-My19681	CP	%	96			70-130	Pass	
Copper	S16-My19681	CP	%	99			70-130	Pass	
Lead	S16-My19681	CP	%	89			70-130	Pass	
Mercury	S16-My19681	CP	%	94			70-130	Pass	
Nickel	S16-My19681	CP	%	91			70-130	Pass	
Zinc	S16-My19681	CP	%	89			70-130	Pass	
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanesulfonic acid (PFOS)	S16-My19686	CP	%	89			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S16-My19686	CP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My19686	CP	%	111			50-150	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My19689	CP	%	80			70-130	Pass	
TRH C10-C14	S16-My19689	CP	%	103			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My19689	CP	%	85			70-130	Pass	
Toluene	S16-My19689	CP	%	82			70-130	Pass	
Ethylbenzene	S16-My19689	CP	%	81			70-130	Pass	
m&p-Xylenes	S16-My19689	CP	%	85			70-130	Pass	
o-Xylene	S16-My19689	CP	%	85			70-130	Pass	
Xylenes - Total	S16-My19689	CP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My19689	CP	%	89			70-130	Pass	
TRH C6-C10	S16-My19689	CP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My19689	CP	%	99			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My19694	CP	%	79			70-130	Pass	
Cadmium	S16-My19694	CP	%	94			70-130	Pass	
Chromium	S16-My19694	CP	%	87			70-130	Pass	
Copper	S16-My19694	CP	%	81			70-130	Pass	
Lead	S16-My19694	CP	%	91			70-130	Pass	
Mercury	S16-My19694	CP	%	99			70-130	Pass	
Nickel	S16-My19694	CP	%	91			70-130	Pass	
Zinc	S16-My19694	CP	%	86			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S16-My19698	CP	%	91			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My19699	CP	%	78			70-130	Pass	
TRH C10-C14	S16-My19699	CP	%	94			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My19699	CP	%	83			70-130	Pass	
Toluene	S16-My19699	CP	%	81			70-130	Pass	
Ethylbenzene	S16-My19699	CP	%	79			70-130	Pass	
m&p-Xylenes	S16-My19699	CP	%	82			70-130	Pass	
o-Xylene	S16-My19699	CP	%	81			70-130	Pass	
Xylenes - Total	S16-My19699	CP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My19699	CP	%	83			70-130	Pass	
TRH C6-C10	S16-My19699	CP	%	77			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-My19699	CP	%	89			70-130	Pass	
Acenaphthylene	S16-My19699	CP	%	88			70-130	Pass	
Anthracene	S16-My19699	CP	%	93			70-130	Pass	
Benz(a)anthracene	S16-My19699	CP	%	92			70-130	Pass	
Benzo(a)pyrene	S16-My19699	CP	%	84			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene	S16-My19699	CP	%	85			70-130	Pass	
Benzo(g.h.i)perylene	S16-My19699	CP	%	93			70-130	Pass	
Benzo(k)fluoranthene	S16-My19699	CP	%	93			70-130	Pass	
Chrysene	S16-My19699	CP	%	99			70-130	Pass	
Dibenz(a.h)anthracene	S16-My19699	CP	%	86			70-130	Pass	
Fluoranthene	S16-My19699	CP	%	89			70-130	Pass	
Fluorene	S16-My19699	CP	%	89			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-My19699	CP	%	89			70-130	Pass	
Naphthalene	S16-My19699	CP	%	91			70-130	Pass	
Phenanthrene	S16-My19699	CP	%	92			70-130	Pass	
Pyrene	S16-My19699	CP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My19699	CP	%	99			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My19705	CP	%	90			70-130	Pass	
Cadmium	S16-My19705	CP	%	99			70-130	Pass	
Chromium	S16-My19705	CP	%	97			70-130	Pass	
Copper	S16-My19705	CP	%	77			70-130	Pass	
Lead	S16-My19705	CP	%	89			70-130	Pass	
Mercury	S16-My19705	CP	%	97			70-130	Pass	
Nickel	S16-My19705	CP	%	94			70-130	Pass	
Zinc	S16-My19705	CP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My19710	CP	%	79			70-130	Pass	
TRH C10-C14	S16-My19710	CP	%	108			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My19710	CP	%	86			70-130	Pass	
Toluene	S16-My19710	CP	%	84			70-130	Pass	
Ethylbenzene	S16-My19710	CP	%	80			70-130	Pass	
m&p-Xylenes	S16-My19710	CP	%	84			70-130	Pass	
o-Xylene	S16-My19710	CP	%	83			70-130	Pass	
Xylenes - Total	S16-My19710	CP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My19710	CP	%	72			70-130	Pass	
TRH C6-C10	S16-My19710	CP	%	72			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-My19710	CP	%	88			70-130	Pass	
Acenaphthylene	S16-My19710	CP	%	86			70-130	Pass	
Anthracene	S16-My19710	CP	%	92			70-130	Pass	
Benz(a)anthracene	S16-My19710	CP	%	98			70-130	Pass	
Benzo(a)pyrene	S16-My19710	CP	%	80			70-130	Pass	
Benzo(b&j)fluoranthene	S16-My19710	CP	%	84			70-130	Pass	
Benzo(g.h.i)perylene	S16-My19710	CP	%	80			70-130	Pass	
Benzo(k)fluoranthene	S16-My19710	CP	%	85			70-130	Pass	
Chrysene	S16-My19710	CP	%	96			70-130	Pass	
Dibenz(a.h)anthracene	S16-My19710	CP	%	78			70-130	Pass	
Fluoranthene	S16-My19710	CP	%	88			70-130	Pass	
Fluorene	S16-My19710	CP	%	87			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Indeno(1.2.3-cd)pyrene	S16-My19710	CP	%	81			70-130	Pass	
Naphthalene	S16-My19710	CP	%	89			70-130	Pass	
Phenanthrene	S16-My19710	CP	%	91			70-130	Pass	
Pyrene	S16-My19710	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My19710	CP	%	108			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-My19681	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-My19681	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My19681	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My19681	CP	%	16	15	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My19688	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My19688	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My19688	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My19688	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My19688	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My19688	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My19688	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My19688	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My19688	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My19688	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My19688	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My19688	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My19688	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My19688	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My19688	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-My19689	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-My19689	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-My19689	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-My19689	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S16-My19689	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S16-My19689	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-My19689	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-My19689	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-My19689	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-My19689	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My19692	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My19692	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My19692	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My19692	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My19692	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My19692	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My19692	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My19692	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My19692	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My19693	CP	mg/kg	4.7	3.7	24	30%	Pass	
Cadmium	S16-My19693	CP	mg/kg	1.7	1.8	5.0	30%	Pass	
Chromium	S16-My19693	CP	mg/kg	12	10	11	30%	Pass	
Copper	S16-My19693	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S16-My19693	CP	mg/kg	12	9.4	20	30%	Pass	
Mercury	S16-My19693	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-My19693	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S16-My19693	CP	mg/kg	200	220	10	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My19694	CP	%	18	18	1.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My19698	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My19698	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My19698	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My19698	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My19698	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My19698	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My19698	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My19698	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My19698	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My19698	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My19698	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My19698	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My19698	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My19698	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My19698	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My19703	CP	mg/kg	3.9	3.7	6.0	30%	Pass	
Cadmium	S16-My19703	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-My19703	CP	mg/kg	10	9.7	7.0	30%	Pass	
Copper	S16-My19703	CP	mg/kg	7.7	8.5	11	30%	Pass	
Lead	S16-My19703	CP	mg/kg	23	23	2.0	30%	Pass	
Mercury	S16-My19703	CP	mg/kg	0.07	0.06	4.0	30%	Pass	
Nickel	S16-My19703	CP	mg/kg	5.4	5.4	<1	30%	Pass	
Zinc	S16-My19703	CP	mg/kg	33	32	4.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My19705	CP	%	13	12	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	B16-My04859	NCP	%	40	40	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C)	S16-My19708	CP	uS/cm	990	940	5.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My19709	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My19709	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My19709	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My19709	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My19709	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My19709	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My19709	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My19709	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My19709	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear standard.

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Ivan Taylor	Senior Analyst-Metal (NSW)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Richard Corner	Senior Analyst-Inorganic (QLD)
Richard Corner	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (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

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	Blair Cummings
Report	501183-AID
Project Name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA110700
Received Date	May 18, 2016
Date Reported	May 26, 2016

Methodology:

Asbestos ID	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. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz 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) Iron ores - Sampling and Sample preparation procedures is employed. 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 and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA110700
Date Sampled	May 16, 2016 to May 18, 2016
Report	501183-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A2_TP07_0.1	16-My19682	May 16, 2016	Approximate Sample 1098g 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.^{M11}
A2_TP08_0.0	16-My19684	May 16, 2016	Approximate Sample 763g 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.^{M11}
A2_TP22_0.2	16-My19687	May 16, 2016	Approximate Sample 907g 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.^{M11}
A2_TP23_0.2	16-My19690	May 16, 2016	Approximate Sample 1058g 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.^{M11}
A2_TP04_0.0	16-My19698	May 17, 2016	Approximate Sample 790g 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.^{M11}
A2_TP06_0.2	16-My19702	May 16, 2016	Approximate Sample 1000g 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.^{M11}
A2_TP18_0.3	16-My19704	May 17, 2016	Approximate Sample 901g 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.^{M11}
A2_TP21_0.2	16-My19706	May 17, 2016	Approximate Sample 730g 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.^{M11}
A2_TP17_0.0	16-My19707	May 18, 2016	Approximate Sample 1024g Sample consisted of: Brown coarse grain soil and rocks	AF: Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.0025g* Estimated asbestos content in AF = 0.0025g* Total estimated asbestos concentration in AF = 0.0002% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected.^{M11}

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 19, 2016	Indefinite

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Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501183	**Due:**	May 26, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Blair Cummings
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**										
1	A2_TP07_0.0	May 16, 2016		Soil	S16-My19681						X	X	X		X
2	A2_TP07_0.1	May 16, 2016		Soil	S16-My19682		X								
3	A2_TP07_0.5	May 16, 2016		Soil	S16-My19683								X		X
4	A2_TP08_0.0	May 16, 2016		Soil	S16-My19684		X								
5	A2_TP08_0.3	May 16, 2016		Soil	S16-My19685								X		X
6	A2_TP22_0.0	May 16, 2016		Soil	S16-My19686						X	X	X		X
7	A2_TP22_0.2	May 16, 2016		Soil	S16-My19687		X								
8	A2_TP22_0.5	May 16, 2016		Soil	S16-My19688								X		X
9	A2_TP23_0.0	May 16, 2016		Soil	S16-My19689						X	X	X		X
10	A2_TP23_0.2	May 16, 2016		Soil	S16-My19690		X						X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
11	A2_BH10_0.5	May 16, 2016		Soil	S16-My19691								X		X
12	A2_BH9_0.0	May 16, 2016		Soil	S16-My19692								X		X
13	A2_BH5_0.5	May 16, 2016		Soil	S16-My19693								X		X
14	A2_BH3_1.5	May 17, 2016		Soil	S16-My19694								X		X
15	A2_BH2_0.0	May 17, 2016		Soil	S16-My19695								X		X
16	A2_BH6_0.5	May 17, 2016		Soil	S16-My19696								X		X
17	A2_TP03_0.3	May 17, 2016		Soil	S16-My19697								X		X
18	A2_TP04_0.0	May 17, 2016		Soil	S16-My19698		X				X	X	X		X
19	A2_TP04_0.5	May 17, 2016		Soil	S16-My19699								X		X
20	A2_TP05_0.0	May 17, 2016		Soil	S16-My19700								X		X
21	A2_TP06_0.0	May 16, 2016		Soil	S16-My19701						X	X	X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
22	A2_TP06_0.2	May 16, 2016		Soil	S16-My19702		X						X		X
23	A2_TP18_0.0	May 17, 2016		Soil	S16-My19703						X	X	X		X
24	A2_TP18_0.3	May 17, 2016		Soil	S16-My19704		X								
25	A2_TP21_0.0	May 17, 2016		Soil	S16-My19705						X	X	X		X
26	A2_TP21_0.2	May 17, 2016		Soil	S16-My19706		X						X		X
27	A2_TP17_0.0	May 18, 2016		Soil	S16-My19707		X				X	X	X		X
28	A2_TP17_2.5	May 18, 2016		Soil	S16-My19708	X				X			X	X	X
29	A2_BH7_0.0	May 18, 2016		Soil	S16-My19709								X		X
30	A2_BH8_0.5	May 18, 2016		Soil	S16-My19710								X		X
31	A2_TP07_1.0	May 16, 2016		Soil	S16-My19711				X						
32	A2_TP07_2.0	May 16, 2016		Soil	S16-My19712				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
33	A2_TP07_2.5	May 16, 2016		Soil	S16-My19713				X						
34	A2_TP08_0.5	May 16, 2016		Soil	S16-My19714				X						
35	A2_TP08_1.0	May 16, 2016		Soil	S16-My19715				X						
36	A2_TP08_2.0	May 16, 2016		Soil	S16-My19716				X						
37	A2_TP08_2.5	May 16, 2016		Soil	S16-My19717				X						
38	A2_TP22_1.0	May 16, 2016		Soil	S16-My19718				X						
39	A2_TP23_0.5	May 16, 2016		Soil	S16-My19719				X						
40	A2_TP23_1.0	May 16, 2016		Soil	S16-My19720				X						
41	A2_TP23_1.0	May 16, 2016		Soil	S16-My19721			X							
42	A2_TP23_2.5	May 16, 2016		Soil	S16-My19722				X						
43	A2_BH10_0.0	May 16, 2016		Soil	S16-My19723				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
44	A2_BH10_1.5	May 16, 2016		Soil	S16-My19724				X						
45	A2_BH9_0.5	May 16, 2016		Soil	S16-My19725				X						
46	A2_BH9_1.5	May 16, 2016		Soil	S16-My19726				X						
47	A2_BH5_0.0	May 16, 2016		Soil	S16-My19727				X						
48	A2_BH5_1.5	May 16, 2016		Soil	S16-My19728				X						
49	A2_BH3_0.0	May 17, 2016		Soil	S16-My19729				X						
50	A2_BH3_0.5	May 17, 2016		Soil	S16-My19730				X						
51	A2_BH2_0.5	May 17, 2016		Soil	S16-My19731				X						
52	A2_BH2_1.5	May 17, 2016		Soil	S16-My19732				X						
53	A2_BH6_0.0	May 17, 2016		Soil	S16-My19733				X						
54	A2_BH6_1.5	May 17, 2016		Soil	S16-My19734				X						

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Fax: 02 9928 2504

Received: May 18, 2016 7:20 PM
Due: May 26, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
55	A2_TP03_0.0	May 17, 2016		Soil	S16-My19735				X						
56	A2_TP03_0.5	May 17, 2016		Soil	S16-My19736				X						
57	A2_TP03_1.0	May 17, 2016		Soil	S16-My19737				X						
58	A2_TP04_0.2	May 17, 2016		Soil	S16-My19738				X						
59	A2_TP04_1.0	May 17, 2016		Soil	S16-My19739				X						
60	A2_TP05_0.3	May 17, 2016		Soil	S16-My19740				X						
61	A2_TP05_0.5	May 17, 2016		Soil	S16-My19741				X						
62	A2_TP05_1.0	May 17, 2016		Soil	S16-My19742				X						
63	A2_TP05_2.0	May 17, 2016		Soil	S16-My19743				X						
64	A2_TP05_2.5	May 17, 2016		Soil	S16-My19744				X						
65	A2_TP06_0.5	May 17, 2016		Soil	S16-My19745				X						

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 501183
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 18, 2016 7:20 PM
Due: May 26, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
66	A2_TP06_1.0	May 17, 2016		Soil	S16-My19746				X						
67	A2_TP06_2.0	May 17, 2016		Soil	S16-My19747				X						
68	A2_TP06_2.5	May 17, 2016		Soil	S16-My19748				X						
69	A2_TP21_0.5	May 17, 2016		Soil	S16-My19749				X						
70	A2_TP21_1.0	May 17, 2016		Soil	S16-My19750				X						
71	A2_TP17_0.5	May 18, 2016		Soil	S16-My19751				X						
72	A2_TP17_1.0	May 18, 2016		Soil	S16-My19752				X						
73	A2_TP17_2.0	May 18, 2016		Soil	S16-My19753				X						
74	A2_BH7_0.5	May 18, 2016		Soil	S16-My19754				X						
75	A2_BH7_1.5	May 18, 2016		Soil	S16-My19755				X						
76	A2_BH8_0.0	May 18, 2016		Soil	S16-My19756				X						

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
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Order No.: IA110700
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Received: May 18, 2016 7:20 PM
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Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						% Clay	Asbestos - WA guidelines	CANCELLED	HOLD	pH (units)(1:5 soil:CaCl2 extract)	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271														X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X		X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X					X				
External Laboratory															
77	A2_BH8_1.5	May 18, 2016		Soil	S16-My19757				X						
78	A2_TP23_2.0	May 16, 2016		Soil	S16-My20037				X						
Test Counts						1	9	1	47	1	8	8	26	1	26

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas	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

Sample Receipt Advice

Company name:	**Jacobs Group (Australia) P/L NSW**
Contact name:	Blair Cummings
Project name:	BANKSTOWN AIRPORT - SITE 2
Project ID:	IA110700
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 18, 2016 7:20 PM
Eurofins | mgt reference:	**501183**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

A2_TP23_1.0 not received, sample cancelled.

Contact notes

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

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

Results will be delivered electronically via e.mail to Blair Cummings - Blair.Cummings@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
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E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
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P +61 3 8564 5000
F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	**Purchase Order**	IA110700	**Project Manager**	BLAIR CUMMINGS	**Project Name**	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	**Eurofins | mgt Quote №**	160413JACN	**Project №**	IA110700	**Electronic Results Format**	ESdat
Contact Name	Michael Stacey					**Email for Results**	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.c
Contact Phone №	02 9032 1467					**Turn Around Requirements**	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other (* Surcharges apply
Special Direction						**Method of Shipment**	☐ Courier (☑ Hand Delivered ☐ Postal
Relinquished by	B.Cummings						
(Signature)							
(Time / Date)	18 : 05/16 1910						

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2-TP07_0.0	16/05/16	Soil		X	X	X																		501183
2	A2-TP07-0.1							X																	
3	A2_TP07_0.5				X																				
4	A2-TP07_1.0																								
5	A2-TP07_2.0																								
6	A2_TP07_2.5																								
7	A2_TP08_0.0							X																	
8	A2_TP08_0.3				X																				
9	A2_TP08_0.5																								
10	A2_TP08_1.0																								
11	A2_TP08_2.0																								
12	A2_TP08_2.5																								

Laboratory Use Only	Received By	Siamak	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18/5/16	Time	19:20	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		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

Page 1 of 7

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab — Unit F3 Building F, 16 Mars Rd, Lane Cove West NSW 2066 P +612 9900 8400 E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab — Unit 1, 21 Smallwood Place, Murarrie QLD 4172 P +617 3902 4600 E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab — 2 Kingston Town Close, Oakleigh, VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090 E EnviroSampleVic@eurofins.com.au

Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by (Signature) (Time / Date)	B.Cummings 19:10 18/5/16
Purchase Order	JA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	IA110700
Project Name	Bankstown Airport - Site 2
Electronic Results Format	Esdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY(Std) ☐ Other( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2_TP22_0.0	16/05/16	Soil		X	X	X																501183
2	A2_TP22_0.2	↓	↓					X															
3	A2_TP22_0.5				X																		
4	A2_TP22_1.0																						
5	A2_TP23_0.0				X	X	X																
6	A2_TP23_0.2				X			X															
7	A2_TP23_0.5																						
8	A2_TP23_1.0																						
9	A2_TP23_2.0																						
10	A2_TP23_2.5	16/05/16																					
11	A2_BH10_0.0	16/05/16																					
12	A2_BH10_0.5	16/05/16			X																		

Laboratory Use Only										
	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18.5.16	Time	19:20	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report №

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Page 2 of 7

CHAIN OF CUSTODY RECORD

ABN 50005085521

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EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS	Project Name	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote No	160413JACN	Project No	IA110700	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone No	02 9032 1467						
Special Direction							
Relinquished by	B. Cummings						
(Signature)							
(Time / Date)	17:10 18/5/16						

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY (Std) ☐ Other ( )

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

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

No	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2_BH10_1.5	16/05/16	Soil																						501183
2	A2_BH9_0.0	↓	↓		X																				
3	A2_BH9_0.5																								
4	A2_BH9_1.5																								
5	A2_BH5_0.0																								
6	A2_BH5_0.5				X																				
7	A2_BH5_1.5	16/05/16																							
8	A2_BH3_0.0	17/05/16																							
9	A2_BH3_0.5	↓																							
10	A2_BH3_1.5				X																				
11	A2_BH2_0.0				X																				
12	A2_BH2_0.5																								

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18.5.16	Time	19:20	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report No	

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Page 3 of 7

CHAIN OF CUSTODY RECORD

ABN 50005085521

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☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company: Jacobs

Address:
Level 4 100 Christie Street
St Leonards NSW 2065

Contact Name: Michael Stacey

Contact Phone No: 02 9032 1467

Special Direction:

Relinquished by: B. Cummings

(Signature):

(Time / Date): 19:10 18/5/16

Purchase Order: IA110700

Eurofins | mgt Quote No: 160413JACN

Project Manager: BLAIR CUMMINGS

Project No: IA110700

Project Name: Bankstown Airport - Site 2

Electronic Results Format: ESdat

Email for Results: Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com

Turn Around Requirements:
☐ 1DAY* ☐ 2DAY* ☐ 3DAY*
☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

No	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2_BH2_1.5	17/05/16	Soil																								S01183
2	A2_BH6_0.0																										
3	A2_BH6_0.5				X																						
4	A2_BH6_1.5																										
5	A2_TP03_0.0																										
6	A2_TP03_0.3				X																						
7	A2_TP03_0.5																										
8	A2_TP03_1.0																										
9	A2_TP04_0.0				X	X	X	X																			
10	A2_TP04_0.2																										
11	A2_TP04_0.5				X																						
12	A2_TP04_1.0																										

Laboratory Use Only										
	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18/5/16	Time	19:20	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report No

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Eurofins | mgt Melbourne Lab
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P +61 3 8564 5000
F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company: Jacobs
Address: Level 4 100 Christie Street
St Leonards NSW 2065
Contact Name: Michael Stacey
Contact Phone №: 02 9032 1467
Special Direction:
Relinquished by (Signature): B.Cummings
(Time / Date): 19:10 18/5/16

Purchase Order: IA110700
Eurofins | mgt Quote №: 160413JACN
Project Manager: BLAIR CUMMINGS
Project №: IA110700
Project Name: Bankstown Airport - Site 2
Electronic Results Format: ESdat
Email for Results: Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co

Turn Around Requirements:
☐ 1DAY* ☐ 2DAY* ☐ 3DAY*
☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2_TP05_0.0	17/05/16	Soil		X																				S01183
2	A2_TP05_0.3																								
3	A2_TP05_0.5																								
4	A2_TP05_1.0																								
5	A2_TP05_2.0																								
6	A2_TP05_2.5																								
7	A2_TP06_0.0				X	X	X																		
8	A2_TP06_0.2				X			X																	
9	A2_TP06_0.5																								
10	A2_TP06_1.0																								
11	A2_TP06_2.0																								
12	A2_TP06_2.5																								

Laboratory Use Only

Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18.5.16	Time	15:20	Signature	SC	Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	___	Signature		Report №	

CHAIN OF CUSTODY RECORD

ABN 50005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F, 16 Mars Rd, Lane Cove West NSW 2066
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E EnviroSampleVic@eurofins.com.au

Company: Jacobs
Address: Level 4 100 Christie Street
St Leonards NSW 2065
Contact Name: Michael Stacey
Contact Phone No: 02 9032 1467
Special Direction:
Relinquished by (Signature) (Time / Date): B. Cummings
19 70 18 / 5 / 10

Purchase Order: IA110700
Eurofins | mgt Quote No: 160413JACN
Project Manager: BLAIR CUMMINGS
Project No: IA110700
Project Name: Bankstown Airport - Site 2
Electronic Results Format: ESdat
Email for Results: Michael.Stacey@jacobs.com

Turn Around Requirements:
☐ 1DAY* ☐ 2DAY* ☐ 3DAY*
☑ 5DAY (Std) ☐ Other ( )
* Surcharges apply

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

Analysis

No	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2_TP18_0.0	17/05/16	Soil		X	X	X																				501183.
2	A2_TP18_0.3							X																			
3	A2_TP21_0.0				X	X	X																				
4	A2_TP21_0.2				X			X																			
5	A2_TP21_0.5																										
6	A2_TP21_1.0	17/05/16																									
7	A2_TP17_0.0	18/05/16			X	X	X	X																			
8	A2_TP17_0.5																										
9	A2_TP17_1.0																										
10	A2_TP17_2.0																										
11	A2_TP17_2.5	18/05/16			X				X	X	X																
12	A2_BH7_0.0	18/05/16			X																						

Laboratory Use Only									
	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18.5.16	Time	19:20	Signature	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__	Signature	Report No

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

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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E EnviroSampleVic@eurofins.com.au

Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by	B. Cummings
(Signature)	
(Time / Date)	19.10 18/5/16
Purchase Order	IA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	B. Cummings
Project №	IA110700
Project Name	Bankstown Airport – Site 2
Electronic Results Format	Esdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.c
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2_BH7_0.5	18/05/16	Soil																								S01183
2	A2_BH7_1.5	↓	↓																								
3	A2_BH8_0.0	↓	↓																								
4	A2_BH8_0.5	↓	↓		X																						
5	A2_BH8_1.5	18/05/16	Soil																								
6																											
7																											
8																											
9																											
10																											
11																											
12																											

Laboratory Use Only										
	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	18/5/16	Time	19:20	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report №

[illegible]

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

Page 7 of 7

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention: **Michael Stacey**

Report **501564-S**
Project name BANKSTOWN AIRPORT - SITE 2
Project ID IA1107200
Received Date May 20, 2016

Client Sample ID			**A2_BH4_0.0**	**A2_BH1_1.5**	**A2_TP10_0.0**	**A2_TP10_0.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22619**	**S16-My22620**	**S16-My22621**	**S16-My22622**
Date Sampled			**May 19, 2016**	**May 19, 2016**	**May 19, 2016**	**May 19, 2016**
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	%	108	99	101	101
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.1	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.4	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	0.7	< 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	0.6	< 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	0.8	< 0.5	1.4	< 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

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH4_0.0** **Soil** **S16-My22619** **May 19, 2016**	**A2_BH1_1.5** **Soil** **S16-My22620** **May 19, 2016**	**A2_TP10_0.0** **Soil** **S16-My22621** **May 19, 2016**	**A2_TP10_0.5** **Soil** **S16-My22622** **May 19, 2016**
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5
Pyrene	0.5	mg/kg	0.8	< 0.5	1.4	< 0.5
Total PAH*	0.5	mg/kg	1.6	< 0.5	4.8	< 0.5
2-Fluorobiphenyl (surr.)	1	%	84	89	93	97
p-Terphenyl-d14 (surr.)	1	%	85	90	93	100
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	-	103	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	116	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	103	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	< 0.005	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	< 0.01	-
13C-PFHxA (surr.)	1	%	-	-	88	-
13C8-PFOS (surr.)	1	%	-	-	110	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_BH4_0.0** **Soil** **S16-My22619** **May 19, 2016**	**A2_BH1_1.5** **Soil** **S16-My22620** **May 19, 2016**	**A2_TP10_0.0** **Soil** **S16-My22621** **May 19, 2016**	**A2_TP10_0.5** **Soil** **S16-My22622** **May 19, 2016**
Heavy Metals						
Arsenic	2	mg/kg	4.8	5.0	5.5	5.4
Cadmium	0.4	mg/kg	0.7	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	12	7.1	12	15
Copper	5	mg/kg	10	9.6	10.0	6.6
Lead	5	mg/kg	39	7.9	30	9.3
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	35	7.7	26	< 5
% Moisture	1	%	11	15	14	19

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP11_0.0** **Soil** **S16-My22623** **May 19, 2016**	**A2_TP11_2.0** **Soil** **S16-My22624** **May 19, 2016**	**A2_TP13_0.0** **Soil** **S16-My22625** **May 19, 2016**	**A2_TP13_0.2** **Soil** **S16-My22626** **May 19, 2016**
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	64	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	64	< 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	%	102	104	100	98
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP11_0.0** **Soil** **S16-My22623** **May 19, 2016**	**A2_TP11_2.0** **Soil** **S16-My22624** **May 19, 2016**	**A2_TP13_0.0** **Soil** **S16-My22625** **May 19, 2016**	**A2_TP13_0.2** **Soil** **S16-My22626** **May 19, 2016**
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	96	89	92	91
p-Terphenyl-d14 (surr.)	1	%	100	92	97	93
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	110	-	112	-
Tetrachloro-m-xylene (surr.)	1	%	123	-	86	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	110	-	112	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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			A2_TP11_0.0	A2_TP11_2.0	A2_TP13_0.0	A2_TP13_0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22623**	**S16-My22624**	**S16-My22625**	**S16-My22626**
Date Sampled			**May 19, 2016**	**May 19, 2016**	**May 19, 2016**	**May 19, 2016**
Test/Reference	LOR	Unit				
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	[N09]0.010	-	< 0.005	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	< 0.01	-
13C-PFHxA (surr.)	1	%	96	-	85	-
13C8-PFOS (surr.)	1	%	120	-	111	-
Heavy Metals						
Arsenic	2	mg/kg	3.4	4.5	10	7.9
Cadmium	0.4	mg/kg	1.5	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.9	5.1	25	12
Copper	5	mg/kg	11	9.1	13	10
Lead	5	mg/kg	44	5.4	910	540
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	6.9	< 5	12	5.6
Zinc	5	mg/kg	43	7.2	30	24
% Moisture	1	%	18	19	15	13

Client Sample ID			A2_TP14_0.3	A2_TP15_0.0	A2_TP15_1.0	A2_TP01_0.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22627**	**S16-My22628**	**S16-My22630**	**S16-My22631**
Date Sampled			**May 19, 2016**	**May 19, 2016**	**May 19, 2016**	**May 19, 2016**
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	290	69	< 50	< 50
TRH C29-C36	50	mg/kg	640	600	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	930	669	< 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	%	100	95	99	99
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	4.1	3.6	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	4.1	3.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	4.1	3.6	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	0.9	0.7	< 0.5	< 0.5

Client Sample ID			**A2_TP14_0.3**	**A2_TP15_0.0**	**A2_TP15_1.0**	**A2_TP01_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22627**	**S16-My22628**	**S16-My22630**	**S16-My22631**
Date Sampled			**May 19, 2016**	**May 19, 2016**	**May 19, 2016**	**May 19, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Anthracene	0.5	mg/kg	0.8	0.6	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.8	0.8	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	2.7	2.4	< 0.5	< 0.5
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	1.9	1.6	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	3.0	2.6	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	2.3	1.8	< 0.5	< 0.5
Chrysene	0.5	mg/kg	1.0	1.0	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	0.7	0.6	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	1.2	1.6	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	2.0	1.8	< 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	1.4	1.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	18.7	17	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	91	93	92	91
p-Terphenyl-d14 (surr.)	1	%	91	95	94	96
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Dibutylchlorendate (surr.)	1	%	-	97	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	102	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	97	-	-

Client Sample ID			**A2_TP14_0.3**	**A2_TP15_0.0**	**A2_TP15_1.0**	**A2_TP01_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22627**	**S16-My22628**	**S16-My22630**	**S16-My22631**
Date Sampled			**May 19, 2016**	**May 19, 2016**	**May 19, 2016**	**May 19, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	700	520	< 100	< 100
TRH >C34-C40	100	mg/kg	510	150	< 100	< 100
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	N09 0.006	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	< 0.005	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	< 0.01	-	-
13C-PFHxA (surr.)	1	%	-	92	-	-
13C8-PFOS (surr.)	1	%	-	112	-	-
Heavy Metals						
Arsenic	2	mg/kg	5.7	7.4	5.4	5.8
Cadmium	0.4	mg/kg	0.8	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	13	12	50
Copper	5	mg/kg	25	14	10	< 5
Lead	5	mg/kg	32	710	12	42
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	36	11	5.3	18
Zinc	5	mg/kg	35	22	< 5	64
% Moisture	1	%	6.2	14	25	11

Client Sample ID			**A2_TP02_0.0**	**A2_TP02_0.5**	**A2_TP09_0.3**	**A2_TP12_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22632**	**S16-My22634**	**S16-My22635**	**S16-My22636**
Date Sampled			**May 20, 2016**	**May 19, 2016**	**May 20, 2016**	**May 20, 2016**
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	240
TRH C29-C36	50	mg/kg	54	< 50	< 50	890
TRH C10-36 (Total)	50	mg/kg	54	< 50	< 50	1130
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	%	98	98	102	91
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 less Naphthalene (F2) N01	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP02_0.0** **Soil** **S16-My22632** **May 20, 2016**	**A2_TP02_0.5** **Soil** **S16-My22634** **May 19, 2016**	**A2_TP09_0.3** **Soil** **S16-My22635** **May 20, 2016**	**A2_TP12_0.0** **Soil** **S16-My22636** **May 20, 2016**
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	3.0
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	3.2
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	3.5
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.3
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.9
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.0
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.9
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.1
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	1.8
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.5
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	2.0
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	16.7
2-Fluorobiphenyl (surr.)	1	%	95	91	86	89
p-Terphenyl-d14 (surr.)	1	%	101	94	92	98
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	-	< 0.2
Toxaphene	1	mg/kg	< 1	-	-	< 1
Dibutylchlorendate (surr.)	1	%	88	-	-	138
Tetrachloro-m-xylene (surr.)	1	%	121	-	-	94

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	A2_TP02_0.0 Soil S16-My22632 May 20, 2016	A2_TP02_0.5 Soil S16-My22634 May 19, 2016	A2_TP09_0.3 Soil S16-My22635 May 20, 2016	A2_TP12_0.0 Soil S16-My22636 May 20, 2016
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	88	-	-	138
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	770
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	880
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	^{N09}0.34	-	-	< 0.005
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	-	< 0.01
13C-PFHxA (surr.)	1	%	104	-	-	88
13C8-PFOS (surr.)	1	%	120	-	-	109
Heavy Metals						
Arsenic	2	mg/kg	3.8	4.6	7.1	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.5
Chromium	5	mg/kg	19	24	15	19
Copper	5	mg/kg	12	5.4	9.4	13
Lead	5	mg/kg	210	8.2	63	760
Mercury	0.05	mg/kg	0.42	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	11	5.1	< 5	11
Zinc	5	mg/kg	47	11	23	23
% Moisture	1	%	8.8	23	9.7	8.8

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	A2_TP12_0.5 Soil S16-My22637 May 20, 2016	A2_TP16_0.3 Soil S16-My22638 May 20, 2016	A2_TP19_0.2 Soil S16-My22639 May 20, 2016	A2_TP20_0.0 Soil S16-My22640 May 20, 2016
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	75
TRH C29-C36	50	mg/kg	220	76	62	240
TRH C10-36 (Total)	50	mg/kg	220	76	62	315
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

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP12_0.5** **Soil** **S16-My22637** **May 20, 2016**	**A2_TP16_0.3** **Soil** **S16-My22638** **May 20, 2016**	**A2_TP19_0.2** **Soil** **S16-My22639** **May 20, 2016**	**A2_TP20_0.0** **Soil** **S16-My22640** **May 20, 2016**
BTEX						
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	98	105	106	105
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.8
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	2.0
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	2.3
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.4
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.2
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.6
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6
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	0.8
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.8
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	9.4
2-Fluorobiphenyl (surr.)	1	%	81	91	89	91
p-Terphenyl-d14 (surr.)	1	%	82	99	100	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID			**A2_TP12_0.5**	**A2_TP16_0.3**	**A2_TP19_0.2**	**A2_TP20_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22637**	**S16-My22638**	**S16-My22639**	**S16-My22640**
Date Sampled			**May 20, 2016**	**May 20, 2016**	**May 20, 2016**	**May 20, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1
Dibutylchlorendate (surr.)	1	%	-	-	-	122
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	88
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	122
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	240	< 100	< 100	260
TRH >C34-C40	100	mg/kg	140	< 100	< 100	130
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	-	^{N09}0.013
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	-	< 0.01
13C-PFHxA (surr.)	1	%	-	-	-	100
13C8-PFOS (surr.)	1	%	-	-	-	121
Heavy Metals						
Arsenic	2	mg/kg	10	10	3.1	5.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.4
Chromium	5	mg/kg	11	9.2	5.5	30
Copper	5	mg/kg	< 5	< 5	< 5	17
Lead	5	mg/kg	710	51	10	54
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	< 5	24
Zinc	5	mg/kg	12	7.9	< 5	50
% Moisture	1	%	7.6	4.0	9.9	10

Client Sample ID			**A2_TP20_1.0**	**A2_QC01**	**A2_QC03**	**TS 160517-1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-My22641**	**S16-My22642**	**S16-My22643**	**S16-My22644**
Date Sampled			**May 20, 2016**	**May 20, 2016**	**May 20, 2016**	**May 20, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	84	-
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	84	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	A2_TP20_1.0 Soil S16-My22641 May 20, 2016	A2_QC01 Soil S16-My22642 May 20, 2016	A2_QC03 Soil S16-My22643 May 20, 2016	TS 160517-1 Soil S16-My22644 May 20, 2016
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	110%
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	109%
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	108%
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	108%
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	108%
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	108%
4-Bromofluorobenzene (surr.)	1	%	102	102	103	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)^{N04}	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene^{N07}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	88	86	86	-
p-Terphenyl-d14 (surr.)	1	%	92	94	94	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	110	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
Heavy Metals						
Arsenic	2	mg/kg	4.7	5.1	3.7	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	15	9.9	6.6	-
Copper	5	mg/kg	11	< 5	< 5	-
Lead	5	mg/kg	11	35	14	-
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Nickel	5	mg/kg	9.0	< 5	< 5	-
Zinc	5	mg/kg	15	7.4	< 5	-
% Moisture	1	%	22	7.9	4.0	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TB 160517-1** **Soil** **S16-My22645** **May 20, 2016**
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	102

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	Sydney	May 24, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	May 23, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 23, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	May 24, 2016	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 23, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	May 23, 2016	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Sydney	May 24, 2016	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	May 24, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
PFOS/PFOA/6:2FTS	Brisbane	May 24, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
% Moisture	Sydney	May 23, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 501564
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 20, 2016 7:30 PM
Due: May 30, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	A2_BH4_0.0	May 19, 2016		Soil	S16-My22619						X	X
2	A2_BH1_1.5	May 19, 2016		Soil	S16-My22620						X	X
3	A2_TP10_0.0	May 19, 2016		Soil	S16-My22621	X			X	X	X	X
4	A2_TP10_0.5	May 19, 2016		Soil	S16-My22622						X	X
5	A2_TP11_0.0	May 19, 2016		Soil	S16-My22623	X			X	X	X	X
6	A2_TP11_2.0	May 19, 2016		Soil	S16-My22624						X	X
7	A2_TP13_0.0	May 19, 2016		Soil	S16-My22625				X	X	X	X
8	A2_TP13_0.2	May 19, 2016		Soil	S16-My22626	X					X	X
9	A2_TP14_0.3	May 19, 2016		Soil	S16-My22627						X	X
10	A2_TP15_0.0	May 19, 2016		Soil	S16-My22628				X	X	X	X

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 20, 2016 7:30 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501564	**Due:**	May 30, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA1107200				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
11	A2_TP15_0.2	May 19, 2016		Soil	S16-My22629	X						
12	A2_TP15_1.0	May 19, 2016		Soil	S16-My22630						X	X
13	A2_TP01_0.0	May 19, 2016		Soil	S16-My22631						X	X
14	A2_TP02_0.0	May 20, 2016		Soil	S16-My22632				X	X	X	X
15	A2_TP02_0.2	May 20, 2016		Soil	S16-My22633	X						
16	A2_TP02_0.5	May 19, 2016		Soil	S16-My22634						X	X
17	A2_TP09_0.3	May 20, 2016		Soil	S16-My22635						X	X
18	A2_TP12_0.0	May 20, 2016		Soil	S16-My22636	X			X	X	X	X
19	A2_TP12_0.5	May 20, 2016		Soil	S16-My22637						X	X
20	A2_TP16_0.3	May 20, 2016		Soil	S16-My22638						X	X
21	A2_TP19_0.2	May 20, 2016		Soil	S16-My22639						X	X

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 20, 2016 7:30 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501564	**Due:**	May 30, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA1107200				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
22	A2_TP20_0.0	May 20, 2016		Soil	S16-My22640	X			X	X	X	X
23	A2_TP20_1.0	May 20, 2016		Soil	S16-My22641						X	X
24	A2_QC01	May 20, 2016		Soil	S16-My22642						X	X
25	A2_QC03	May 20, 2016		Soil	S16-My22643						X	X
26	TS 160517-1	May 20, 2016		Soil	S16-My22644			X				
27	TB 160517-1	May 20, 2016		Soil	S16-My22645			X				
28	A2_BH4_0.5	May 19, 2016		Soil	S16-My22650		X					
29	A2_BH4_1.5	May 19, 2016		Soil	S16-My22651		X					
30	A2_BH1_0.0	May 19, 2016		Soil	S16-My22652		X					
31	A2_BH1_0.5	May 19, 2016		Soil	S16-My22653		X					
32	A2_TP10_0.2	May 19, 2016		Soil	S16-My22654		X					

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501564
		Phone:	02 9928 2100
		Fax:	02 9928 2504
Project Name:	BANKSTOWN AIRPORT - SITE 2		
Project ID:	IA1107200		

Received: May 20, 2016 7:30 PM
Due: May 30, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
33	A2_TP10_1.0	May 19, 2016		Soil	S16-My22655		X					
34	A2_TP10_2.0	May 19, 2016		Soil	S16-My22656		X					
35	A2_TP10_2.5	May 19, 2016		Soil	S16-My22657		X					
36	A2_TP11_0.2	May 19, 2016		Soil	S16-My22658		X					
37	A2_TP11_0.5	May 19, 2016		Soil	S16-My22659		X					
38	A2_TP11_1.0	May 19, 2016		Soil	S16-My22660		X					
39	A2_TP11_2.5	May 19, 2016		Soil	S16-My22661		X					
40	A2_TP13_0.5	May 19, 2016		Soil	S16-My22662		X					
41	A2_TP13_1.0	May 19, 2016		Soil	S16-My22663		X					
42	A2_TP13_2.0	May 19, 2016		Soil	S16-My22664		X					
43	A2_TP13_2.5	May 19, 2016		Soil	S16-My22665		X					

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 20, 2016 7:30 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501564	**Due:**	May 30, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA1107200				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
44	A2_TP14_0.0	May 19, 2016		Soil	S16-My22666		X					
45	A2_TP14_0.5	May 19, 2016		Soil	S16-My22667		X					
46	A2_TP14_1.0	May 19, 2016		Soil	S16-My22668		X					
47	A2_TP14_2.0	May 19, 2016		Soil	S16-My22669		X					
48	A2_TP14_2.5	May 19, 2016		Soil	S16-My22670		X					
49	A2_TP15_0.5	May 19, 2016		Soil	S16-My22671		X					
50	A2_TP15_2.0	May 19, 2016		Soil	S16-My22672		X					
51	A2_TP15_2.5	May 19, 2016		Soil	S16-My22673		X					
52	A2_TP01_0.5	May 20, 2016		Soil	S16-My22674		X					
53	A2_TP01_1.0	May 20, 2016		Soil	S16-My22675		X					
54	A2_TP02_1.0	May 20, 2016		Soil	S16-My22676		X					

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 20, 2016 7:30 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501564	**Due:**	May 30, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA1107200				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
55	A2_TP09_0.0	May 20, 2016		Soil	S16-My22677		X					
56	A2_TP09_0.5	May 20, 2016		Soil	S16-My22678		X					
57	A2_TP09_1.0	May 20, 2016		Soil	S16-My22679		X					
58	A2_TP09_2.0	May 20, 2016		Soil	S16-My22680		X					
59	A2_TP09_2.5	May 20, 2016		Soil	S16-My22681		X					
60	A2_TP12_1.0	May 20, 2016		Soil	S16-My22682		X					
61	A2_TP12_2.0	May 20, 2016		Soil	S16-My22683		X					
62	A2_TP12_2.5	May 20, 2016		Soil	S16-My22684		X					
63	A2_TP16_0.0	May 20, 2016		Soil	S16-My22685		X					
64	A2_TP16_0.5	May 20, 2016		Soil	S16-My22686		X					
65	A2_TP16_1.0	May 20, 2016		Soil	S16-My22687		X					

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 20, 2016 7:30 PM
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Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA1107200				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
66	A2_TP16_2.0	May 20, 2016		Soil	S16-My22688		X					
67	A2_TP16_2.5	May 20, 2016		Soil	S16-My22689		X					
68	A2_TP19_0.0	May 20, 2016		Soil	S16-My22690		X					
69	A2_TP19_0.5	May 20, 2016		Soil	S16-My22691		X					
70	A2_TP19_1.0	May 20, 2016		Soil	S16-My22692		X					
71	A2_TP20_0.5	May 20, 2016		Soil	S16-My22693		X					
Test Counts						7	44	2	7	7	23	23

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram	**mg/l:** milligrams per litre
ug/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres	

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%

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	
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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	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	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	90			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	93			70-130	Pass	
Toluene	%	93			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
o-Xylene	%	96			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	100			70-130	Pass	
TRH C6-C10	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	%	94			70-130	Pass	
Acenaphthylene	%	92			70-130	Pass	
Anthracene	%	98			70-130	Pass	
Benz(a)anthracene	%	100			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	%	102			70-130	Pass	
Benzo(g.h.i)perylene	%	77			70-130	Pass	
Benzo(k)fluoranthene	%	99			70-130	Pass	
Chrysene	%	95			70-130	Pass	
Dibenz(a.h)anthracene	%	78			70-130	Pass	
Fluoranthene	%	96			70-130	Pass	
Fluorene	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	79			70-130	Pass	
Naphthalene	%	95			70-130	Pass	
Phenanthrene	%	91			70-130	Pass	
Pyrene	%	97			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	116			70-130	Pass	
4.4'-DDD	%	119			70-130	Pass	
4.4'-DDE	%	118			70-130	Pass	
4.4'-DDT	%	129			70-130	Pass	
a-BHC	%	115			70-130	Pass	
Aldrin	%	116			70-130	Pass	
b-BHC	%	109			70-130	Pass	
d-BHC	%	116			70-130	Pass	
Dieldrin	%	117			70-130	Pass	
Endosulfan I	%	122			70-130	Pass	
Endosulfan II	%	117			70-130	Pass	
Endosulfan sulphate	%	115			70-130	Pass	
Endrin	%	116			70-130	Pass	
Endrin aldehyde	%	128			70-130	Pass	
Endrin ketone	%	116			70-130	Pass	
g-BHC (Lindane)	%	112			70-130	Pass	
Heptachlor	%	123			70-130	Pass	
Heptachlor epoxide	%	112			70-130	Pass	
Hexachlorobenzene	%	120			70-130	Pass	
Methoxychlor	%	102			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	104			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	95			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	115			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	107			70-130	Pass	
Cadmium	%	118			70-130	Pass	
Chromium	%	93			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	97			70-130	Pass	
Lead			%	102			70-130	Pass	
Mercury			%	123			70-130	Pass	
Nickel			%	109			70-130	Pass	
Zinc			%	109			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-My22600	NCP	%	122			70-130	Pass	
4.4'-DDD	S16-My22963	NCP	%	125			70-130	Pass	
4.4'-DDE	S16-My22600	NCP	%	124			70-130	Pass	
4.4'-DDT	S16-My22600	NCP	%	113			70-130	Pass	
a-BHC	S16-My22600	NCP	%	116			70-130	Pass	
Aldrin	S16-My22600	NCP	%	118			70-130	Pass	
b-BHC	S16-My22600	NCP	%	105			70-130	Pass	
d-BHC	S16-My22600	NCP	%	118			70-130	Pass	
Dieldrin	S16-My22600	NCP	%	125			70-130	Pass	
Endosulfan I	S16-My22600	NCP	%	127			70-130	Pass	
Endosulfan II	S16-My22600	NCP	%	124			70-130	Pass	
Endosulfan sulphate	S16-My22600	NCP	%	114			70-130	Pass	
Endrin	S16-My22600	NCP	%	118			70-130	Pass	
Endrin aldehyde	S16-My22600	NCP	%	128			70-130	Pass	
Endrin ketone	S16-My22600	NCP	%	123			70-130	Pass	
g-BHC (Lindane)	S16-My22600	NCP	%	110			70-130	Pass	
Heptachlor	S16-My22600	NCP	%	122			70-130	Pass	
Heptachlor epoxide	S16-My22600	NCP	%	122			70-130	Pass	
Hexachlorobenzene	S16-My22600	NCP	%	117			70-130	Pass	
Methoxychlor	S16-My22600	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My22622	CP	%	89			70-130	Pass	
TRH C10-C14	S16-My22622	CP	%	98			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My22622	CP	%	87			70-130	Pass	
Toluene	S16-My22622	CP	%	87			70-130	Pass	
Ethylbenzene	S16-My22622	CP	%	87			70-130	Pass	
m&p-Xylenes	S16-My22622	CP	%	90			70-130	Pass	
o-Xylene	S16-My22622	CP	%	90			70-130	Pass	
Xylenes - Total	S16-My22622	CP	%	90			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My22622	CP	%	96			70-130	Pass	
TRH C6-C10	S16-My22622	CP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My22622	CP	%	95			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-My22623	CP	%	95			70-130	Pass	
Acenaphthylene	S16-My22623	CP	%	97			70-130	Pass	
Anthracene	S16-My22623	CP	%	103			70-130	Pass	
Benz(a)anthracene	S16-My22623	CP	%	106			70-130	Pass	
Benzo(a)pyrene	S16-My22623	CP	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene	S16-My22623	CP	%	94			70-130	Pass	
Benzo(g.h.i)perylene	S16-My22623	CP	%	104			70-130	Pass	
Benzo(k)fluoranthene	S16-My22623	CP	%	109			70-130	Pass	
Chrysene	S16-My22623	CP	%	107			70-130	Pass	
Dibenz(a.h)anthracene	S16-My22623	CP	%	88			70-130	Pass	
Fluoranthene	S16-My22623	CP	%	122			70-130	Pass	
Fluorene	S16-My22623	CP	%	95			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-My22623	CP	%	97			70-130	Pass	
Naphthalene	S16-My22623	CP	%	97			70-130	Pass	
Phenanthrene	S16-My22623	CP	%	108			70-130	Pass	
Pyrene	S16-My22623	CP	%	120			70-130	Pass	
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanesulfonic acid (PFOS)	S16-My22623	CP	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S16-My22623	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My22623	CP	%	110			50-150	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S16-My22625	CP	%	87			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My22626	CP	%	110			70-130	Pass	
Cadmium	S16-My22626	CP	%	112			70-130	Pass	
Chromium	S16-My22626	CP	%	96			70-130	Pass	
Copper	S16-My22626	CP	%	110			70-130	Pass	
Mercury	S16-My22626	CP	%	101			70-130	Pass	
Nickel	S16-My22626	CP	%	107			70-130	Pass	
Zinc	S16-My22626	CP	%	127			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-My22634	CP	%	75			70-130	Pass	
TRH C10-C14	S16-My22634	CP	%	101			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-My22634	CP	%	83			70-130	Pass	
Toluene	S16-My22634	CP	%	84			70-130	Pass	
Ethylbenzene	S16-My22634	CP	%	86			70-130	Pass	
m&p-Xylenes	S16-My22634	CP	%	88			70-130	Pass	
o-Xylene	S16-My22634	CP	%	89			70-130	Pass	
Xylenes - Total	S16-My22634	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-My22634	CP	%	95			70-130	Pass	
TRH C6-C10	S16-My22634	CP	%	79			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-My22634	CP	%	101			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-My22635	CP	%	100			70-130	Pass	
Acenaphthylene	S16-My22635	CP	%	96			70-130	Pass	
Anthracene	S16-My22635	CP	%	102			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	S16-My22635	CP	%	113			70-130	Pass	
Benzo(a)pyrene	S16-My22635	CP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	S16-My22635	CP	%	112			70-130	Pass	
Benzo(g.h.i)perylene	S16-My22635	CP	%	97			70-130	Pass	
Benzo(k)fluoranthene	S16-My22635	CP	%	91			70-130	Pass	
Chrysene	S16-My22635	CP	%	108			70-130	Pass	
Dibenz(a.h)anthracene	S16-My22635	CP	%	87			70-130	Pass	
Fluoranthene	S16-My22635	CP	%	114			70-130	Pass	
Fluorene	S16-My22635	CP	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-My22635	CP	%	93			70-130	Pass	
Naphthalene	S16-My22635	CP	%	98			70-130	Pass	
Phenanthrene	S16-My22635	CP	%	104			70-130	Pass	
Pyrene	S16-My22635	CP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-My22638	CP	%	93			70-130	Pass	
Cadmium	S16-My22638	CP	%	104			70-130	Pass	
Chromium	S16-My22638	CP	%	77			70-130	Pass	
Copper	S16-My22638	CP	%	108			70-130	Pass	
Lead	S16-My22638	CP	%	79			70-130	Pass	
Mercury	S16-My22638	CP	%	101			70-130	Pass	
Nickel	S16-My22638	CP	%	93			70-130	Pass	
Zinc	S16-My22638	CP	%	90			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My22621	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My22621	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My22621	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My22621	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My22621	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My22621	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My22621	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My22621	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My22621	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My22621	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My22621	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My22621	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My22621	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My22621	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My22621	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-My22621	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-My22621	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-My22621	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My22622	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-My22623	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-My22623	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-My22623	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-My22623	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD			
Aroclor-1016	S16-My22623	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1232	S16-My22623	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-My22623	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-My22623	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-My22623	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-My22623	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My22625	CP	mg/kg	10	8.8	16	30%	Pass	
Cadmium	S16-My22625	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-My22625	CP	mg/kg	25	15	49	30%	Fail	Q15
Copper	S16-My22625	CP	mg/kg	13	20	45	30%	Fail	Q15
Lead	S16-My22625	CP	mg/kg	910	910	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	S16-My22625	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-My22625	CP	mg/kg	12	11	16	30%	Pass	
Zinc	S16-My22625	CP	mg/kg	30	21	35	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My22625	CP	%	15	21	11	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My22632	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-My22632	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-My22632	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-My22632	CP	mg/kg	54	61	12	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My22632	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My22632	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My22632	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My22632	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My22632	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My22632	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My22632	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My22632	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-My22632	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-My22632	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-My22632	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-My22634	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-My22636	CP	%	8.8	7.9	11	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-My22637	CP	mg/kg	10	8.3	20	30%	Pass	
Cadmium	S16-My22637	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-My22637	CP	mg/kg	11	10	9.0	30%	Pass	
Copper	S16-My22637	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	S16-My22637	CP	mg/kg	710	650	8.0	30%	Pass	
Mercury	S16-My22637	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-My22637	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S16-My22637	CP	mg/kg	12	9.1	25	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-My22643	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-My22643	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-My22643	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-My22643	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-My22643	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-My22643	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-My22643	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-My22643	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-My22643	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear standard.
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Bob Symons	Senior Analyst-Inorganic (NSW)
Ivan Taylor	Senior Analyst-Metal (NSW)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Richard Corner	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (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

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	Michael Stacey
Report	501564-AID
Project Name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA1107200
Received Date	May 20, 2016
Date Reported	May 30, 2016

Methodology:

Asbestos ID	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. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz 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) Iron ores - Sampling and Sample preparation procedures is employed. 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 and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA1107200
Date Sampled	May 19, 2016 to May 20, 2016
Report	501564-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A2_TP10_0.0	16-My22621	May 19, 2016	Approximate Sample 875g 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.^{M11}
A2_TP11_0.0	16-My22623	May 19, 2016	Approximate Sample 1045g 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.^{M11}
A2_TP13_0.2	16-My22626	May 19, 2016	Approximate Sample 1032g 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.^{M11}
A2_TP15_0.2	16-My22629	May 19, 2016	Approximate Sample 1078g 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.^{M11}
A2_TP02_0.2	16-My22633	May 20, 2016	Approximate Sample 789g 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.^{M11}
A2_TP12_0.0	16-My22636	May 20, 2016	Approximate Sample 1032g 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.^{M11}
A2_TP20_0.0	16-My22640	May 20, 2016	Approximate Sample 976g 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.^{M11}

Sample History

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

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

Description	**Testing Site**	**Extracted**	**Holding Time**
Asbestos - LTM-ASB-8020	Sydney	May 23, 2016	Indefinite

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 501564
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: May 20, 2016 7:30 PM
Due: May 30, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	A2_BH4_0.0	May 19, 2016		Soil	S16-My22619						X	X
2	A2_BH1_1.5	May 19, 2016		Soil	S16-My22620						X	X
3	A2_TP10_0.0	May 19, 2016		Soil	S16-My22621	X			X	X	X	X
4	A2_TP10_0.5	May 19, 2016		Soil	S16-My22622						X	X
5	A2_TP11_0.0	May 19, 2016		Soil	S16-My22623	X			X	X	X	X
6	A2_TP11_2.0	May 19, 2016		Soil	S16-My22624						X	X
7	A2_TP13_0.0	May 19, 2016		Soil	S16-My22625				X	X	X	X
8	A2_TP13_0.2	May 19, 2016		Soil	S16-My22626	X					X	X
9	A2_TP14_0.3	May 19, 2016		Soil	S16-My22627						X	X
10	A2_TP15_0.0	May 19, 2016		Soil	S16-My22628				X	X	X	X

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Project Name: BANKSTOWN AIRPORT - SITE 2
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Received: May 20, 2016 7:30 PM
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Contact Name: Michael Stacey

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
11	A2_TP15_0.2	May 19, 2016		Soil	S16-My22629	X						
12	A2_TP15_1.0	May 19, 2016		Soil	S16-My22630						X	X
13	A2_TP01_0.0	May 19, 2016		Soil	S16-My22631						X	X
14	A2_TP02_0.0	May 20, 2016		Soil	S16-My22632				X	X	X	X
15	A2_TP02_0.2	May 20, 2016		Soil	S16-My22633	X						
16	A2_TP02_0.5	May 19, 2016		Soil	S16-My22634						X	X
17	A2_TP09_0.3	May 20, 2016		Soil	S16-My22635						X	X
18	A2_TP12_0.0	May 20, 2016		Soil	S16-My22636	X			X	X	X	X
19	A2_TP12_0.5	May 20, 2016		Soil	S16-My22637						X	X
20	A2_TP16_0.3	May 20, 2016		Soil	S16-My22638						X	X
21	A2_TP19_0.2	May 20, 2016		Soil	S16-My22639						X	X

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	May 20, 2016 7:30 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	501564	**Due:**	May 30, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
22	A2_TP20_0.0	May 20, 2016		Soil	S16-My22640	X			X	X	X	X
23	A2_TP20_1.0	May 20, 2016		Soil	S16-My22641						X	X
24	A2_QC01	May 20, 2016		Soil	S16-My22642						X	X
25	A2_QC03	May 20, 2016		Soil	S16-My22643						X	X
26	TS 160517-1	May 20, 2016		Soil	S16-My22644			X				
27	TB 160517-1	May 20, 2016		Soil	S16-My22645			X				
28	A2_BH4_0.5	May 19, 2016		Soil	S16-My22650		X					
29	A2_BH4_1.5	May 19, 2016		Soil	S16-My22651		X					
30	A2_BH1_0.0	May 19, 2016		Soil	S16-My22652		X					
31	A2_BH1_0.5	May 19, 2016		Soil	S16-My22653		X					
32	A2_TP10_0.2	May 19, 2016		Soil	S16-My22654		X					

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Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
33	A2_TP10_1.0	May 19, 2016		Soil	S16-My22655		X					
34	A2_TP10_2.0	May 19, 2016		Soil	S16-My22656		X					
35	A2_TP10_2.5	May 19, 2016		Soil	S16-My22657		X					
36	A2_TP11_0.2	May 19, 2016		Soil	S16-My22658		X					
37	A2_TP11_0.5	May 19, 2016		Soil	S16-My22659		X					
38	A2_TP11_1.0	May 19, 2016		Soil	S16-My22660		X					
39	A2_TP11_2.5	May 19, 2016		Soil	S16-My22661		X					
40	A2_TP13_0.5	May 19, 2016		Soil	S16-My22662		X					
41	A2_TP13_1.0	May 19, 2016		Soil	S16-My22663		X					
42	A2_TP13_2.0	May 19, 2016		Soil	S16-My22664		X					
43	A2_TP13_2.5	May 19, 2016		Soil	S16-My22665		X					

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Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
44	A2_TP14_0.0	May 19, 2016		Soil	S16-My22666		X					
45	A2_TP14_0.5	May 19, 2016		Soil	S16-My22667		X					
46	A2_TP14_1.0	May 19, 2016		Soil	S16-My22668		X					
47	A2_TP14_2.0	May 19, 2016		Soil	S16-My22669		X					
48	A2_TP14_2.5	May 19, 2016		Soil	S16-My22670		X					
49	A2_TP15_0.5	May 19, 2016		Soil	S16-My22671		X					
50	A2_TP15_2.0	May 19, 2016		Soil	S16-My22672		X					
51	A2_TP15_2.5	May 19, 2016		Soil	S16-My22673		X					
52	A2_TP01_0.5	May 20, 2016		Soil	S16-My22674		X					
53	A2_TP01_1.0	May 20, 2016		Soil	S16-My22675		X					
54	A2_TP02_1.0	May 20, 2016		Soil	S16-My22676		X					

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Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
55	A2_TP09_0.0	May 20, 2016		Soil	S16-My22677		X					
56	A2_TP09_0.5	May 20, 2016		Soil	S16-My22678		X					
57	A2_TP09_1.0	May 20, 2016		Soil	S16-My22679		X					
58	A2_TP09_2.0	May 20, 2016		Soil	S16-My22680		X					
59	A2_TP09_2.5	May 20, 2016		Soil	S16-My22681		X					
60	A2_TP12_1.0	May 20, 2016		Soil	S16-My22682		X					
61	A2_TP12_2.0	May 20, 2016		Soil	S16-My22683		X					
62	A2_TP12_2.5	May 20, 2016		Soil	S16-My22684		X					
63	A2_TP16_0.0	May 20, 2016		Soil	S16-My22685		X					
64	A2_TP16_0.5	May 20, 2016		Soil	S16-My22686		X					
65	A2_TP16_1.0	May 20, 2016		Soil	S16-My22687		X					

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Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA1107200

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B13	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271												
Sydney Laboratory - NATA Site # 18217						X	X	X		X	X	X
Brisbane Laboratory - NATA Site # 20794									X			
External Laboratory												
66	A2_TP16_2.0	May 20, 2016		Soil	S16-My22688		X					
67	A2_TP16_2.5	May 20, 2016		Soil	S16-My22689		X					
68	A2_TP19_0.0	May 20, 2016		Soil	S16-My22690		X					
69	A2_TP19_0.5	May 20, 2016		Soil	S16-My22691		X					
70	A2_TP19_1.0	May 20, 2016		Soil	S16-My22692		X					
71	A2_TP20_0.5	May 20, 2016		Soil	S16-My22693		X					
Test Counts						7	44	2	7	7	23	23

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas	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

eurofins | mgt

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

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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

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

Sample Receipt Advice

Company name:	**Jacobs Group (Australia) P/L NSW**
Contact name:	Michael Stacey
Project name:	BANKSTOWN AIRPORT - SITE 2
Project ID:	IA1107200
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 20, 2016 7:30 PM
Eurofins | mgt reference:	**501564**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

A2-QC02 and A2-QC04 forwarded to ALS|

Contact notes

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

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

Results will be delivered electronically via e.mail to Michael Stacey - michael.stacey@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50005085521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1,21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600 E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	B. Cummings	Project Name	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA107200	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone №	02 9032 1467					Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Special Direction						Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
Relinquished by (Signature) (Time / Date)	B.Cummings 19 : 10 20/5/16						

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

	№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
	1	A2_BH4_0.0	19/05/16	Soil		X																					
	2	A2_BH4_0.5	↓	↓																							
	3	A2_BH4_1.5	↓	↓																							
	4	A2_BH1_0.0	↓	↓																							
	5	A2_BH1_0.5	↓	↓																							
	6	A2_BH1_1.5	↓	↓		X																					
3	7	A2_TP10_0.0	↓	↓		X	X	X	X																		
	8	A2_TP10_0.2	↓	↓		~~X~~																					
	9	A2_TP10_0.5	↓	↓		X																					
	10	A2_TP10_1.0	↓	↓																							
	11	A2_TP10_2.0	↓	↓																							
	12	A2_TP10_2.5	↓	↓																							

Laboratory Use Only	Received By	Siamak	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20/5/16	Time	1930	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report №	501564

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.

Page 1 of 7

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066
P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1, 21 Smallwood Place Murarrie QLD 4172
P +617 3902 4600
E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166
P +61 3 8564 5000
F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company Jacobs

Address Level 4 100 Christie Street
St Leonards NSW 2065

Contact Name Michael Stacey

Contact Phone № 02 9032 1467

Special Direction

Relinquished by (Signature) (Time / Date) B. Cummings
19 10 20 / 5 / 16

Purchase Order IA110700

Eurofins | mgt Quote № 160413JACN

Project Manager B. Cummings

Project № IA110700

Project Name Bankstown Airport – Site 2

Electronic Results Format ESdat

Email for Results Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co

Turn Around Requirements
☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply
☑ 5DAY (Std) ☐ Other ( )

Method of Shipment
☐ Courier ( )
☑ Hand Delivered
☐ Postal

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2_TP11_0.0	19/05/16	Soil		X	X	X	X																		
2	A2_TP11_0.2	↓	↓																							
3	A2_TP11_0.5	↓	↓																							
4	A2_TP11_1.0	↓	↓																							
5	A2_TP11_2.0	↓	↓		X																					
6	A2_TP11_2.5	↓	↓																							
7 7	A2_TP13_0.0	↓	↓		X	X	X																			
8 8	A2_TP13_0.2	↓	↓		X			X																		
9	A2_TP13_0.5	↓	↓																							
10	A2_TP13_1.0	↓	↓																							
11	A2_TP13_2.0	↓	↓																							
12	A2_TP13_2.5	↓	↓																							

Laboratory Use Only

Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20.5.16	Time	__:__	Signature		Temperature	
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №	

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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☐ Eurofins | mgt Brisbane Lab
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☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	**Purchase Order**	IA110700	**Project Manager**	BLAIR CUMMINGS
Address	Level 4 100 Christie Street St Leonards NSW 2065	**Eurofins | mgt Quote №**	160413JACN	**Project №**	IA110700
Contact Name	Michael Stacey			**Project Name**	Bankstown Airport - Site 2
Contact Phone №	02 9032 1467			**Electronic Results Format**	ESdat
Special Direction				**Email for Results**	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co
Relinquished by (Signature) (Time / Date)	B.Cummings 19:10 20/05/16			**Turn Around Requirements**	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )

Method of Shipment
☐ Courier ( )
☑ Hand Delivered
☐ Postal

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

	№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
	1	A2_TP14_0.0	19/05/16	Soil																								
a	2	A2_TP14_0.3				X																						
	3	A2_TP14_0.5																										
	4	A2_TP14_1.0																										
	5	A2_TP14_2.0																										
	6	A2_TP14_2.5																										
10	7	A2_TP15_0.0				X	X	X																				
	8	A2_TP15_0.2							X																			
	9	A2_TP15_0.5																										
	10	A2_TP15_1.0				X																						
	11	A2_TP15_2.0																										
	12	A2_TP15_2.5																										

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20/5/16	Time	__:__	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report №	

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ABN 50 005 085 521

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☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close, Oakleigh, VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone No	02 9032 1467
Special Direction	
Relinquished by (Signature)	B. Cummings
(Time / Date)	19 : 10 20 / 05 / 16
Purchase Order	IA110700
Eurofins | mgt Quote No	160413JACN
Project Manager	BLAIR CUMMINGS
Project No	IA110700
Project Name	Bankstown Airport - Site 2
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.c
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

No	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
13 1	A2_TP01_0.0	20/05/16	Soil		X																						
2	A2_TP01_0.5	↓	↓																								
3	A2_TP01_1.0																										
14 4	A2_TP02_0.0				X	X	X																				
15 5	A2_TP02_0.2							X																			
6	A2_TP02_0.5				X																						
7	A2_TP02_1.0																										
8	A2_TP09_0.0																										
9	A2_TP09_0.3				X																						
10	A2_TP09_0.5																										
11	A2_TP09_1.0																										
12	A2_TP09_2.0	↓	↓																								

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	225/16	Time	__:__	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		Report No	

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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E EnviroSampleVic@eurofins.com.au

Company	Jacobs	**Purchase Order**	IA110700	**Project Manager**	BLAIR CUMMINGS	**Project Name**	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	**Eurofins | mgt Quote №**	160413JACN	**Project №**	IA110700	**Electronic Results Format**	ESdat
Contact Name	Michael Stacey					**Email for Results**	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co
Contact Phone №	02 9032 1467					**Turn Around Requirements**	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Special Direction							
Relinquished by (Signature) (Time / Date)	B.Cummings 19 10 20/05/16					**Method of Shipment**	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

18

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEX/N/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEX/N/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2_TP09-2.5	20/05/16	Soil																								
2	A2-TP12-0.0	↓	↓		X	X	X	X																			
3	A2-TP12-0.5				X																						
4	A2-TP12-1.0																										
5	A2-TP12-2.0																										
6	A2-TP12-2.5																										
7	A2-TP16-0.0																										
8	A2-TP16-0.3				X																						
9	A2-TP16-0.5																										
10	A2-TP16-1.0																										
11	A2-TP16-2.0																										
12	A2-TP16-2.5	↓	↓																								

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20/5/16	Time		Signature	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	/ /	Time		Signature	Report №

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS	Project Name	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote No	160413JACN	Project No	IA110700	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone No	02 9032 1467					Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Special Direction						Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
Relinquished by	B. Cummings						
(Signature)							
(Time / Date)	19 : 10 20 / 05 / 16						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

No	Client Sample ID	Date	Matrix	Soil BTEX	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2_TP19_0.0	20/05/16	Soil																								
2	A2-TP19_0.2				X																						
3	A2-TP19-0.5																										
4	A2-TP19-1.0																										
2 5	A2-TP20_0.0				X	X	X	X																			
6	A2-TP20-0.5																										
7	A2-TP20-1.0				X																						
8	A2-QC01				X																						
9	A2-QC02				X																						Please forward to ALS
10	A2-QC03				X																						
11	A2-QC04				X																						Please forward to ALS
12	TS 160517-1	↓	↓	X																							

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20/5/16	Time	__ __	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__ __	Signature		Report No	

Page 6 of 7

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

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2 Kingston Town Close, Oakleigh, VIC 3166
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F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS	Project Name	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone №	02 9032 1467					Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Special Direction						Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
Relinquished by (Signature) (Time / Date)	Blair Cummings 19 : 10 20 / 05 / 16						

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil BTEX	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	TB 160517-1	20/05/16	Soil	X																						
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20/5/16	Time	__:__	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	__:__	Signature		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

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	**Michael Stacey**
Report	**502799-S**
Project name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA110700
Received Date	Jun 01, 2016

Client Sample ID			**A2_TP24_0.0**	**A2_TP24_0.5**	**A2_TP25_0.3**	**A2_TP26_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01229**	**S16-Jn01230**	**S16-Jn01231**	**S16-Jn01232**
Date Sampled			**May 30, 2016**	**May 30, 2016**	**May 31, 2016**	**May 31, 2016**
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	%	61	59	52	64
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID			**A2_TP24_0.0**	**A2_TP24_0.5**	**A2_TP25_0.3**	**A2_TP26_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01229**	**S16-Jn01230**	**S16-Jn01231**	**S16-Jn01232**
Date Sampled			**May 30, 2016**	**May 30, 2016**	**May 31, 2016**	**May 31, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 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	94	94	93
p-Terphenyl-d14 (surr.)	1	%	95	93	93	89
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	1	mg/kg	< 1	-	-	< 1
Dibutylchlorendate (surr.)	1	%	68	-	-	83
Tetrachloro-m-xylene (surr.)	1	%	69	-	-	67
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	68	-	-	83
Tetrachloro-m-xylene (surr.)	1	%	69	-	-	67
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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			**A2_TP24_0.0**	**A2_TP24_0.5**	**A2_TP25_0.3**	**A2_TP26_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01229**	**S16-Jn01230**	**S16-Jn01231**	**S16-Jn01232**
Date Sampled			**May 30, 2016**	**May 30, 2016**	**May 31, 2016**	**May 31, 2016**
Test/Reference	LOR	Unit				
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	^{N09}0.035	-	-	< 0.005
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	-	< 0.01
13C-PFHxA (surr.)	1	%	98	-	-	101
13C8-PFOS (surr.)	1	%	108	-	-	101
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.3	2.2	6.3
Cadmium	0.4	mg/kg	< 0.4	0.5	< 0.4	0.6
Chromium	5	mg/kg	10	20	9.3	13
Copper	5	mg/kg	< 5	5.9	< 5	17
Lead	5	mg/kg	8.8	5.1	12	24
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1
Nickel	5	mg/kg	< 5	< 5	< 5	7.8
Zinc	5	mg/kg	< 5	< 5	< 5	39
% Moisture	1	%	5.9	15	7.8	8.9

Client Sample ID			**A2_TP26_1.0**	**A2_TP27_0.0**	**A2_TP28_0.3**	**A2_TP29_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01233**	**S16-Jn01234**	**S16-Jn01235**	**S16-Jn01236**
Date Sampled			**May 31, 2016**	**May 31, 2016**	**May 31, 2016**	**May 31, 2016**
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	%	56	53	50	50
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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

Client Sample ID			**A2_TP26_1.0**	**A2_TP27_0.0**	**A2_TP28_0.3**	**A2_TP29_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01233**	**S16-Jn01234**	**S16-Jn01235**	**S16-Jn01236**
Date Sampled			**May 31, 2016**	**May 31, 2016**	**May 31, 2016**	**May 31, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	92	90	96
p-Terphenyl-d14 (surr.)	1	%	98	92	91	89
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Dibutylchlorendate (surr.)	1	%	-	-	-	56
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	66
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP26_1.0** **Soil** **S16-Jn01233** **May 31, 2016**	**A2_TP27_0.0** **Soil** **S16-Jn01234** **May 31, 2016**	**A2_TP28_0.3** **Soil** **S16-Jn01235** **May 31, 2016**	**A2_TP29_0.0** **Soil** **S16-Jn01236** **May 31, 2016**
Polychlorinated Biphenyls						
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	56
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	66
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	-	-	-	< 0.005
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	-	-	-	< 0.005
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	-	-	-	< 0.01
13C-PFHxA (surr.)	1	%	-	-	-	81
13C8-PFOS (surr.)	1	%	-	-	-	89
Heavy Metals						
Arsenic	2	mg/kg	5.2	2.3	4.0	2.3
Cadmium	0.4	mg/kg	< 0.4	0.9	< 0.4	< 0.4
Chromium	5	mg/kg	18	10	14	15
Copper	5	mg/kg	11	10	6.3	17
Lead	5	mg/kg	13	110	16	91
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	5.7	< 5	< 5
Zinc	5	mg/kg	6.4	25	11	57
% Moisture	1	%	16	6.2	7.4	7.5

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP29_0.5** **Soil** **S16-Jn01237** **May 31, 2016**	**A2_TP30_0.2** **Soil** **S16-Jn01238** **May 31, 2016**	**A2_TP31_0.0** **Soil** **S16-Jn01239** **May 31, 2016**	**A2_TP32_0.0** **Soil** **S16-Jn01240** **May 31, 2016**
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	%	53	54	54	54

Client Sample ID			**A2_TP29_0.5**	**A2_TP30_0.2**	**A2_TP31_0.0**	**A2_TP32_0.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01237**	**S16-Jn01238**	**S16-Jn01239**	**S16-Jn01240**
Date Sampled			**May 31, 2016**	**May 31, 2016**	**May 31, 2016**	**May 31, 2016**
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	100	88	90	86
p-Terphenyl-d14 (surr.)	1	%	102	88	92	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
Heavy Metals						
Arsenic	2	mg/kg	< 2	2.8	2.2	7.6
Cadmium	0.4	mg/kg	0.5	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	25	13	13	15
Copper	5	mg/kg	11	5.9	10	10
Lead	5	mg/kg	6.7	9.0	12	2200
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	7.2	< 5	7.9	5.5
Zinc	5	mg/kg	9.5	8.9	18	25
% Moisture	1	%	19	6.9	9.8	8.0

Client Sample ID			**A2_TP33_0.0**	**A2_TP33_0.5**	**A2_QC05**	**A2_QC07**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01241**	**S16-Jn01242**	**S16-Jn01243**	**S16-Jn01244**
Date Sampled			**May 31, 2016**	**May 31, 2016**	**May 31, 2016**	**May 31, 2016**
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	%	59	50	54	50
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 less Naphthalene (F2)^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
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	%	108	83	82	80
p-Terphenyl-d14 (surr.)	1	%	99	93	89	90
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	A2_TP33_0.0 Soil S16-Jn01241 May 31, 2016	A2_TP33_0.5 Soil S16-Jn01242 May 31, 2016	A2_QC05 Soil S16-Jn01243 May 31, 2016	A2_QC07 Soil S16-Jn01244 May 31, 2016
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.05	mg/kg	< 0.05	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	99	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	65	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	-
Total PCB*	0.1	mg/kg	< 0.1	-	-	-
Dibutylchlorendate (surr.)	1	%	99	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	65	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	< 0.005	-	-	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	-	-
13C-PFHxA (surr.)	1	%	101	-	-	-
13C8-PFOS (surr.)	1	%	116	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.6	4.1	< 2
Cadmium	0.4	mg/kg	0.6	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	29	10	6.3
Copper	5	mg/kg	46	11	< 5	12
Lead	5	mg/kg	20	14	14	5.5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	110	5.4	< 5	9.2
Zinc	5	mg/kg	44	7.1	5.5	14
% Moisture	1	%	10	21	9.7	10

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2_TP34_0.0** **Soil** **S16-Jn01245** **Jun 01, 2016**	**A2_TP34_0.3** **Soil** **S16-Jn01246** **Jun 01, 2016**	**A2_TP35_0.0** **Soil** **S16-Jn01247** **Jun 01, 2016**	**A2_TP35_1.0** **Soil** **S16-Jn01249** **Jun 01, 2016**
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	%	85	81	80	63
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 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
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	%	78	73	84	78
p-Terphenyl-d14 (surr.)	1	%	85	80	94	89
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID			A2_TP34_0.0	A2_TP34_0.3	A2_TP35_0.0	A2_TP35_1.0
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Jn01245**	**S16-Jn01246**	**S16-Jn01247**	**S16-Jn01249**
Date Sampled			**Jun 01, 2016**	**Jun 01, 2016**	**Jun 01, 2016**	**Jun 01, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	124	-	126	-
Tetrachloro-m-xylene (surr.)	1	%	61	-	87	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	124	-	126	-
Tetrachloro-m-xylene (surr.)	1	%	61	-	87	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	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
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.005	mg/kg	[N09]0.020	-	[N09]0.028	-
Perfluorooctanoic acid (PFOA)	0.005	mg/kg	< 0.005	-	< 0.005	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.01	mg/kg	< 0.01	-	< 0.01	-
13C-PFHxA (surr.)	1	%	102	-	100	-
13C8-PFOS (surr.)	1	%	112	-	107	-
Heavy Metals						
Arsenic	2	mg/kg	< 2	3.3	< 2	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	15	16	11
Copper	5	mg/kg	9.6	10	20	11
Lead	5	mg/kg	11	24	36	7.9
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.1	< 5	10	< 5
Zinc	5	mg/kg	15	20	35	5.3
% Moisture	1	%	9.3	9.4	9.7	18

Client Sample ID			TS160517-6	TB160517-6
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S16-Jn01250	S16-Jn01251
Date Sampled			Jun 01, 2016	Jun 01, 2016
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.1	mg/kg	102%	< 0.1
Toluene	0.1	mg/kg	102%	< 0.1
Ethylbenzene	0.1	mg/kg	102%	< 0.1
m&p-Xylenes	0.2	mg/kg	102%	< 0.2
o-Xylene	0.1	mg/kg	102%	< 0.1
Xylenes - Total	0.3	mg/kg	102%	< 0.3
4-Bromofluorobenzene (surr.)	1	%	84	81

Sample History

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

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

Description	**Testing Site**	**Extracted**	**Holding Time**
Eurofins | mgt Suite B7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Jun 02, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Melbourne	Jun 02, 2016	14 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Jun 02, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Jun 02, 2016	28 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Eurofins | mgt Suite B13			
Organochlorine Pesticides	Melbourne	Jun 02, 2016	14 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Polychlorinated Biphenyls	Melbourne	Jun 02, 2016	28 Day
- Method: USEPA 8082 Polychlorinated Biphenyls			
PFOS/PFOA/6:2FTS	Brisbane	Jun 06, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			
% Moisture	Melbourne	Jun 01, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	Jun 1, 2016 3:45 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502799	**Due:**	Jun 8, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	A2_TP24_0.0	May 30, 2016		Soil	S16-Jn01229	X			X	X	X	X
2	A2_TP24_0.5	May 30, 2016		Soil	S16-Jn01230						X	X
3	A2_TP25_0.3	May 31, 2016		Soil	S16-Jn01231						X	X
4	A2_TP26_0.0	May 31, 2016		Soil	S16-Jn01232	X			X	X	X	X
5	A2_TP26_1.0	May 31, 2016		Soil	S16-Jn01233						X	X
6	A2_TP27_0.0	May 31, 2016		Soil	S16-Jn01234						X	X
7	A2_TP28_0.3	May 31, 2016		Soil	S16-Jn01235						X	X
8	A2_TP29_0.0	May 31, 2016		Soil	S16-Jn01236	X			X	X	X	X
9	A2_TP29_0.5	May 31, 2016		Soil	S16-Jn01237						X	X
10	A2_TP30_0.2	May 31, 2016		Soil	S16-Jn01238						X	X

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	Jun 1, 2016 3:45 PM
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		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
11	A2_TP31_0.0	May 31, 2016		Soil	S16-Jn01239						X	X
12	A2_TP32_0.0	May 31, 2016		Soil	S16-Jn01240						X	X
13	A2_TP33_0.0	May 31, 2016		Soil	S16-Jn01241	X			X	X	X	X
14	A2_TP33_0.5	May 31, 2016		Soil	S16-Jn01242						X	X
15	A2_QC05	May 31, 2016		Soil	S16-Jn01243						X	X
16	A2_QC07	May 31, 2016		Soil	S16-Jn01244						X	X
17	A2_TP34_0.0	Jun 01, 2016		Soil	S16-Jn01245	X			X	X	X	X
18	A2_TP34_0.3	Jun 01, 2016		Soil	S16-Jn01246						X	X
19	A2_TP35_0.0	Jun 01, 2016		Soil	S16-Jn01247				X	X	X	X
20	A2_TP35_0.2	Jun 01, 2016		Soil	S16-Jn01248	X						
21	A2_TP35_1.0	Jun 01, 2016		Soil	S16-Jn01249						X	X

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	Jun 1, 2016 3:45 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502799	**Due:**	Jun 8, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
22	TS160517-6	Jun 01, 2016		Soil	S16-Jn01250			X				
23	TB160517-6	Jun 01, 2016		Soil	S16-Jn01251			X				
24	A2_TP24_1.0	May 30, 2016		Soil	S16-Jn01253		X					
25	A2_TP25_0.0	May 31, 2016		Soil	S16-Jn01254		X					
26	A2_TP25_0.5	May 31, 2016		Soil	S16-Jn01255		X					
27	A2_TP25_1.0	May 31, 2016		Soil	S16-Jn01256		X					
28	A2_TP26_0.4	May 31, 2016		Soil	S16-Jn01257		X					
29	A2_TP26_0.6	May 31, 2016		Soil	S16-Jn01258		X					
30	A2_TP27_0.3	May 31, 2016		Soil	S16-Jn01259		X					
31	A2_TP27_0.6	May 31, 2016		Soil	S16-Jn01260		X					
32	A2_TP27_1.0	May 31, 2016		Soil	S16-Jn01261		X					

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Order No.: IA110700
Report #: 502799
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
33	A2_TP28_0.0	May 31, 2016		Soil	S16-Jn01262		X					
34	A2_TP28_0.5	May 31, 2016		Soil	S16-Jn01263		X					
35	A2_TP28_1.0	May 31, 2016		Soil	S16-Jn01264		X					
36	A2_TP29_0.3	May 31, 2016		Soil	S16-Jn01265		X					
37	A2_TP29_1.0	May 31, 2016		Soil	S16-Jn01266		X					
38	A2_TP30_0.0	May 31, 2016		Soil	S16-Jn01267		X					
39	A2_TP30_0.5	May 31, 2016		Soil	S16-Jn01268		X					
40	A2_TP30_1.0	May 31, 2016		Soil	S16-Jn01269		X					
41	A2_TP31_0.5	May 31, 2016		Soil	S16-Jn01270		X					
42	A2_TP31_1.0	May 31, 2016		Soil	S16-Jn01271		X					
43	A2_TP32_0.2	May 31, 2016		Soil	S16-Jn01272		X					

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502799
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
44	A2_TP32_0.5	May 31, 2016		Soil	S16-Jn01273		X					
45	A2_TP32_1.0	May 31, 2016		Soil	S16-Jn01274		X					
46	A2_TP33_0.2	May 31, 2016		Soil	S16-Jn01275		X					
47	A2_TP33_1.0	May 31, 2016		Soil	S16-Jn01276		X					
48	A2_TP34_0.5	Jun 01, 2016		Soil	S16-Jn01277		X					
49	A2_TP34_1.0	Jun 01, 2016		Soil	S16-Jn01278		X					
50	A2_TP35_0.5	Jun 01, 2016		Soil	S16-Jn01279		X					
Test Counts						6	27	2	6	6	20	20

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram

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. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%

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	
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	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/kg	< 0.005			0.005	Pass	
Perfluorooctanoic acid (PFOA)	mg/kg	< 0.005			0.005	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/kg	< 0.01			0.01	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	%	87			70-130	Pass	
TRH C10-C14	%	114			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	84			70-130	Pass	
Toluene	%	85			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	84			70-130	Pass	
Xylenes - Total	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	76			70-130	Pass	
TRH C6-C10	%	84			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	%	101			70-130	Pass	
Acenaphthylene	%	99			70-130	Pass	
Anthracene	%	108			70-130	Pass	
Benz(a)anthracene	%	83			70-130	Pass	
Benzo(a)pyrene	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	%	87			70-130	Pass	
Benzo(g.h.i)perylene	%	73			70-130	Pass	
Benzo(k)fluoranthene	%	98			70-130	Pass	
Chrysene	%	110			70-130	Pass	
Dibenz(a.h)anthracene	%	92			70-130	Pass	
Fluoranthene	%	88			70-130	Pass	
Fluorene	%	100			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	89			70-130	Pass	
Naphthalene	%	95			70-130	Pass	
Phenanthrene	%	93			70-130	Pass	
Pyrene	%	87			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	72			70-130	Pass	
4.4'-DDE	%	117			70-130	Pass	
4.4'-DDT	%	97			70-130	Pass	
a-BHC	%	107			70-130	Pass	
Aldrin	%	95			70-130	Pass	
b-BHC	%	111			70-130	Pass	
d-BHC	%	89			70-130	Pass	
Dieldrin	%	110			70-130	Pass	
Endosulfan I	%	82			70-130	Pass	
Endosulfan II	%	70			70-130	Pass	
Endosulfan sulphate	%	71			70-130	Pass	
Endrin	%	114			70-130	Pass	
Endrin aldehyde	%	113			70-130	Pass	
Endrin ketone	%	73			70-130	Pass	
g-BHC (Lindane)	%	101			70-130	Pass	
Heptachlor	%	102			70-130	Pass	
Heptachlor epoxide	%	84			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	120			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	95			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	110			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	111			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	110			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	102			80-120	Pass	
Copper	%	104			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead			%	100			80-120	Pass	
Mercury			%	91			75-125	Pass	
Nickel			%	98			80-120	Pass	
Zinc			%	94			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	S16-Jn01229	CP	%	86			70-130	Pass	
4.4'-DDE	S16-Jn01229	CP	%	123			70-130	Pass	
4.4'-DDT	S16-Jn01229	CP	%	117			70-130	Pass	
a-BHC	S16-Jn01229	CP	%	84			70-130	Pass	
Aldrin	S16-Jn01229	CP	%	74			70-130	Pass	
b-BHC	S16-Jn01229	CP	%	81			70-130	Pass	
d-BHC	S16-Jn01229	CP	%	111			70-130	Pass	
Dieldrin	S16-Jn01229	CP	%	117			70-130	Pass	
Endosulfan I	S16-Jn01229	CP	%	86			70-130	Pass	
Endosulfan II	S16-Jn01229	CP	%	127			70-130	Pass	
Endosulfan sulphate	S16-Jn01229	CP	%	124			70-130	Pass	
Endrin	S16-Jn01229	CP	%	116			70-130	Pass	
Endrin aldehyde	S16-Jn01229	CP	%	125			70-130	Pass	
Endrin ketone	S16-Jn01229	CP	%	121			70-130	Pass	
g-BHC (Lindane)	S16-Jn01229	CP	%	79			70-130	Pass	
Heptachlor	S16-Jn01229	CP	%	76			70-130	Pass	
Heptachlor epoxide	S16-Jn01229	CP	%	104			70-130	Pass	
Hexachlorobenzene	S16-Jn01229	CP	%	91			70-130	Pass	
Methoxychlor	S16-Jn01229	CP	%	87			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S16-Jn01229	CP	%	119			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	B16-Jn01846	NCP	%	76			75-125	Pass	
Spike - % Recovery									
PFOS/PFOA/6:2FTS				Result 1					
Perfluorooctanesulfonic acid (PFOS)	S16-Jn01232	CP	%	129			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S16-Jn01232	CP	%	114			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-Jn01232	CP	%	108			50-150	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Jn01233	CP	%	77			70-130	Pass	
TRH C10-C14	S16-Jn01233	CP	%	102			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-Jn01233	CP	%	76			70-130	Pass	
Toluene	S16-Jn01233	CP	%	75			70-130	Pass	
Ethylbenzene	S16-Jn01233	CP	%	78			70-130	Pass	
m&p-Xylenes	S16-Jn01233	CP	%	82			70-130	Pass	
o-Xylene	S16-Jn01233	CP	%	88			70-130	Pass	
Xylenes - Total	S16-Jn01233	CP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Jn01233	CP	%	77			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C10	S16-Jn01233	CP	%	70			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Jn01233	CP	%	99			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Jn01236	CP	%	90			75-125	Pass	
Cadmium	S16-Jn01236	CP	%	81			75-125	Pass	
Chromium	S16-Jn01236	CP	%	87			75-125	Pass	
Copper	S16-Jn01236	CP	%	95			75-125	Pass	
Mercury	S16-Jn01236	CP	%	94			70-130	Pass	
Zinc	S16-Jn01236	CP	%	87			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Jn01237	CP	%	97			70-130	Pass	
Acenaphthylene	S16-Jn01237	CP	%	100			70-130	Pass	
Anthracene	S16-Jn01237	CP	%	101			70-130	Pass	
Benz(a)anthracene	S16-Jn01237	CP	%	92			70-130	Pass	
Benzo(a)pyrene	S16-Jn01237	CP	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Jn01237	CP	%	110			70-130	Pass	
Benzo(g.h.i)perylene	S16-Jn01237	CP	%	74			70-130	Pass	
Benzo(k)fluoranthene	S16-Jn01237	CP	%	122			70-130	Pass	
Chrysene	S16-Jn01237	CP	%	105			70-130	Pass	
Dibenz(a.h)anthracene	S16-Jn01237	CP	%	85			70-130	Pass	
Fluoranthene	S16-Jn01237	CP	%	87			70-130	Pass	
Fluorene	S16-Jn01237	CP	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn01237	CP	%	93			70-130	Pass	
Naphthalene	S16-Jn01237	CP	%	95			70-130	Pass	
Phenanthrene	S16-Jn01237	CP	%	100			70-130	Pass	
Pyrene	S16-Jn01237	CP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Jn01246	CP	%	86			75-125	Pass	
Cadmium	S16-Jn01246	CP	%	87			75-125	Pass	
Chromium	S16-Jn01246	CP	%	87			75-125	Pass	
Copper	S16-Jn01246	CP	%	100			75-125	Pass	
Nickel	S16-Jn01246	CP	%	79			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Jn01247	CP	%	90			70-130	Pass	
Acenaphthylene	S16-Jn01247	CP	%	91			70-130	Pass	
Anthracene	S16-Jn01247	CP	%	91			70-130	Pass	
Benz(a)anthracene	S16-Jn01247	CP	%	96			70-130	Pass	
Benzo(a)pyrene	S16-Jn01247	CP	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Jn01247	CP	%	91			70-130	Pass	
Benzo(g.h.i)perylene	S16-Jn01247	CP	%	92			70-130	Pass	
Benzo(k)fluoranthene	S16-Jn01247	CP	%	96			70-130	Pass	
Chrysene	S16-Jn01247	CP	%	98			70-130	Pass	
Dibenz(a.h)anthracene	S16-Jn01247	CP	%	108			70-130	Pass	
Fluoranthene	S16-Jn01247	CP	%	99			70-130	Pass	
Fluorene	S16-Jn01247	CP	%	92			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn01247	CP	%	101			70-130	Pass	
Naphthalene	S16-Jn01247	CP	%	90			70-130	Pass	
Phenanthrene	S16-Jn01247	CP	%	89			70-130	Pass	
Pyrene	S16-Jn01247	CP	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M16-Jn00200	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	M16-Jn00200	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	M16-Jn00200	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-Jn01229	CP	mg/kg	0.035	0.034	5.0	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-Jn01229	CP	mg/kg	< 0.005	< 0.005	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-Jn01229	CP	mg/kg	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	M16-Jn04231	NCP	mg/kg	0.3	0.3	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M16-Jn01089	NCP	%	25	25	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-Jn01232	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-Jn01232	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-Jn01232	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-Jn01232	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Jn01232	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-Jn01232	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-Jn01232	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-Jn01232	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-Jn01232	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-Jn01232	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Jn01232	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-Jn01232	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Jn01232	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-Jn01232	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-Jn01232	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Jn01235	CP	mg/kg	4.0	2.1	61	30%	Fail	Q15
Cadmium	S16-Jn01235	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Jn01235	CP	mg/kg	14	11	18	30%	Pass	
Copper	S16-Jn01235	CP	mg/kg	6.3	5.6	13	30%	Pass	
Lead	S16-Jn01235	CP	mg/kg	16	13	20	30%	Pass	
Nickel	S16-Jn01235	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S16-Jn01235	CP	mg/kg	11	9.2	13	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Jn01236	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Jn01236	CP	mg/kg	2.3	7.0	100	30%	Fail	Q15
Cadmium	S16-Jn01236	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Jn01236	CP	mg/kg	15	16	6.0	30%	Pass	
Copper	S16-Jn01236	CP	mg/kg	17	18	4.0	30%	Pass	
Lead	S16-Jn01236	CP	mg/kg	91	87	4.0	30%	Pass	
Nickel	S16-Jn01236	CP	mg/kg	< 5	5.7	20	30%	Pass	
Zinc	S16-Jn01236	CP	mg/kg	57	56	3.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S16-Jn01242	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-Jn01242	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-Jn01242	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Jn01242	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-Jn01242	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-Jn01242	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Jn01245	CP	mg/kg	< 2	3.0	70	30%	Fail	Q15
Cadmium	S16-Jn01245	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Jn01245	CP	mg/kg	14	19	31	30%	Fail	Q15
Copper	S16-Jn01245	CP	mg/kg	9.6	13	32	30%	Fail	Q15
Lead	S16-Jn01245	CP	mg/kg	11	16	35	30%	Fail	Q15
Nickel	S16-Jn01245	CP	mg/kg	6.1	8.3	30	30%	Pass	Q15
Zinc	S16-Jn01245	CP	mg/kg	15	22	37	30%	Fail	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Jn01246	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Jn01246	CP	mg/kg	3.3	3.1	7.0	30%	Pass	
Cadmium	S16-Jn01246	CP	mg/kg	< 0.4	0.4	9.0	30%	Pass	
Chromium	S16-Jn01246	CP	mg/kg	15	15	2.0	30%	Pass	
Copper	S16-Jn01246	CP	mg/kg	10	10	2.0	30%	Pass	
Lead	S16-Jn01246	CP	mg/kg	24	24	<1	30%	Pass	
Nickel	S16-Jn01246	CP	mg/kg	< 5	5.2	11	30%	Pass	
Zinc	S16-Jn01246	CP	mg/kg	20	19	4.0	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear standard.
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Andrew Black	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Mele Singh	Senior Analyst-Organic (VIC)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Richard Corner	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Volatile (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

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention:	Michael Stacey
Report	502799-AID
Project Name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA110700
Received Date	Jun 01, 2016
Date Reported	Jun 08, 2016

Methodology:

Asbestos ID	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. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz 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) Iron ores - Sampling and Sample preparation procedures is employed. 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 and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name	BANKSTOWN AIRPORT - SITE 2
Project ID	IA110700
Date Sampled	May 30, 2016 to Jun 01, 2016
Report	502799-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
A2_TP24_0.0	16-Jn01229	May 30, 2016	Approximate Sample 824g 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.^{M11}
A2_TP26_0.0	16-Jn01232	May 31, 2016	Approximate Sample 987g 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.^{M11}
A2_TP29_0.0	16-Jn01236	May 31, 2016	Approximate Sample 852g 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.^{M11}
A2_TP33_0.0	16-Jn01241	May 31, 2016	Approximate Sample 840g 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.^{M11}
A2_TP34_0.0	16-Jn01245	Jun 01, 2016	Approximate Sample 866g 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.^{M11}
A2_TP35_0.2	16-Jn01248	Jun 01, 2016	Approximate Sample 847g Sample consisted of: Pale grey fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.^{M11}

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 01, 2016	Indefinite

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502799
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	A2_TP24_0.0	May 30, 2016		Soil	S16-Jn01229	X			X	X	X	X
2	A2_TP24_0.5	May 30, 2016		Soil	S16-Jn01230						X	X
3	A2_TP25_0.3	May 31, 2016		Soil	S16-Jn01231						X	X
4	A2_TP26_0.0	May 31, 2016		Soil	S16-Jn01232	X			X	X	X	X
5	A2_TP26_1.0	May 31, 2016		Soil	S16-Jn01233						X	X
6	A2_TP27_0.0	May 31, 2016		Soil	S16-Jn01234						X	X
7	A2_TP28_0.3	May 31, 2016		Soil	S16-Jn01235						X	X
8	A2_TP29_0.0	May 31, 2016		Soil	S16-Jn01236	X			X	X	X	X
9	A2_TP29_0.5	May 31, 2016		Soil	S16-Jn01237						X	X
10	A2_TP30_0.2	May 31, 2016		Soil	S16-Jn01238						X	X

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	Jun 1, 2016 3:45 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	502799	**Due:**	Jun 8, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Michael Stacey
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
11	A2_TP31_0.0	May 31, 2016		Soil	S16-Jn01239						X	X
12	A2_TP32_0.0	May 31, 2016		Soil	S16-Jn01240						X	X
13	A2_TP33_0.0	May 31, 2016		Soil	S16-Jn01241	X			X	X	X	X
14	A2_TP33_0.5	May 31, 2016		Soil	S16-Jn01242						X	X
15	A2_QC05	May 31, 2016		Soil	S16-Jn01243						X	X
16	A2_QC07	May 31, 2016		Soil	S16-Jn01244						X	X
17	A2_TP34_0.0	Jun 01, 2016		Soil	S16-Jn01245	X			X	X	X	X
18	A2_TP34_0.3	Jun 01, 2016		Soil	S16-Jn01246						X	X
19	A2_TP35_0.0	Jun 01, 2016		Soil	S16-Jn01247				X	X	X	X
20	A2_TP35_0.2	Jun 01, 2016		Soil	S16-Jn01248	X						
21	A2_TP35_1.0	Jun 01, 2016		Soil	S16-Jn01249						X	X

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502799
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
22	TS160517-6	Jun 01, 2016		Soil	S16-Jn01250			X				
23	TB160517-6	Jun 01, 2016		Soil	S16-Jn01251			X				
24	A2_TP24_1.0	May 30, 2016		Soil	S16-Jn01253		X					
25	A2_TP25_0.0	May 31, 2016		Soil	S16-Jn01254		X					
26	A2_TP25_0.5	May 31, 2016		Soil	S16-Jn01255		X					
27	A2_TP25_1.0	May 31, 2016		Soil	S16-Jn01256		X					
28	A2_TP26_0.4	May 31, 2016		Soil	S16-Jn01257		X					
29	A2_TP26_0.6	May 31, 2016		Soil	S16-Jn01258		X					
30	A2_TP27_0.3	May 31, 2016		Soil	S16-Jn01259		X					
31	A2_TP27_0.6	May 31, 2016		Soil	S16-Jn01260		X					
32	A2_TP27_1.0	May 31, 2016		Soil	S16-Jn01261		X					

Company Name: Jacobs Group (Australia) P/L NSW
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Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
33	A2_TP28_0.0	May 31, 2016		Soil	S16-Jn01262		X					
34	A2_TP28_0.5	May 31, 2016		Soil	S16-Jn01263		X					
35	A2_TP28_1.0	May 31, 2016		Soil	S16-Jn01264		X					
36	A2_TP29_0.3	May 31, 2016		Soil	S16-Jn01265		X					
37	A2_TP29_1.0	May 31, 2016		Soil	S16-Jn01266		X					
38	A2_TP30_0.0	May 31, 2016		Soil	S16-Jn01267		X					
39	A2_TP30_0.5	May 31, 2016		Soil	S16-Jn01268		X					
40	A2_TP30_1.0	May 31, 2016		Soil	S16-Jn01269		X					
41	A2_TP31_0.5	May 31, 2016		Soil	S16-Jn01270		X					
42	A2_TP31_1.0	May 31, 2016		Soil	S16-Jn01271		X					
43	A2_TP32_0.2	May 31, 2016		Soil	S16-Jn01272		X					

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 502799
Phone: 02 9928 2100
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Received: Jun 1, 2016 3:45 PM
Due: Jun 8, 2016
Priority: 5 Day
Contact Name: Michael Stacey

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Eurofins | mgt Suite B13	PFOS/PFOA/6:2FTS	Moisture Set	Eurofins | mgt Suite B7
Melbourne Laboratory - NATA Site # 1254 & 14271							X		X		X	X
Sydney Laboratory - NATA Site # 18217						X		X				X
Brisbane Laboratory - NATA Site # 20794										X		
External Laboratory												
44	A2_TP32_0.5	May 31, 2016		Soil	S16-Jn01273		X					
45	A2_TP32_1.0	May 31, 2016		Soil	S16-Jn01274		X					
46	A2_TP33_0.2	May 31, 2016		Soil	S16-Jn01275		X					
47	A2_TP33_1.0	May 31, 2016		Soil	S16-Jn01276		X					
48	A2_TP34_0.5	Jun 01, 2016		Soil	S16-Jn01277		X					
49	A2_TP34_1.0	Jun 01, 2016		Soil	S16-Jn01278		X					
50	A2_TP35_0.5	Jun 01, 2016		Soil	S16-Jn01279		X					
Test Counts						6	27	2	6	6	20	20

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas	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

Sample Receipt Advice

Company name: **Jacobs Group (Australia) P/L NSW**

Contact name: Michael Stacey
Project name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Jun 1, 2016 3:45 PM
Eurofins | mgt reference: **502799**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

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

Results will be delivered electronically via e.mail to Michael Stacey - michael.stacey@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F, 16 Mars Rd, Lane Cove West, NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

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☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close, Oakleigh, VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700
Contact Name	Michael Stacey				
Contact Phone №	02 9032 1467				
Special Direction					
Relinquished by	B. Cummings				
(Signature)					
(Time / Date)	15:20 1/06/16				

Project Name: Bankstown Airport - Site 2
Electronic Results Format: ESdat
Email for Results: Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.c

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY (Std.) ☐ Other ( )

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

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2-TP24-0.0	30/05/16	Soil		X	X	X	X																		
2	A2-TP24-0.5	30/05/16	↓		X																					
3	A2-TP24-1.0	30/05/16																								
4	A2-TP25-0.0	31/05/16																								
5	A2-TP25-0.3	↓			X																					
6	A2-TP25-0.5																									
7	A2-TP25-1.0																									
8	A2-TP26-0.0				X	X	X	X																		
9	A2-TP26-0.4																									
10	A2-TP26-0.6																									
11	A2-TP26-1.0				X																					
12	A2-TP27-0.0				X																					502799

Laboratory Use Only	Received By	Samak	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	1/6/6	Time	1345	Signature		Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		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

Page 1 of 5

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1, 21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600 E
EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close, Oakleigh, VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by (Signature)	B. Cummings
(Time / Date)	15 : 20 1 / 06 / 16
Purchase Order	IA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	IA110700
Project Name	Bankstown Airport - Site 2
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.co
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2_TP27_0.3	31/05/16	Soil																						
2	A2_TP27_0.6																								
3	A2_TP27_1.0																								
4	A2_TP28_0.0																								
5	A2_TP28_0.3				X																				
6	A2_TP28_0.5																								
7	A2_TP28_1.0																								
8	A2_TP29_0.0				X	X	X	X																	
9	A2_TP29_0.3																								
10	A2_TP29_0.5				X																				
11	A2_TP29_1.0																								
12	A2_TP30_0.0																								

Laboratory Use Only								
Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	1 / 6 / 16	Time	15 45	Signature	Temperature
Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__ / __ / __	Time	____	Signature	Report №

QS3000_R0 Modified by F.Samiya Approved by T.Lekkas Approved on 10 Jan 2015

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CHAIN OF CUSTODY RECORD

ABN 50005085521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
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EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by	B. Cummings
(Signature)	
(Time / Date)	15 : 20 1 / 06 / 16
Purchase Order	IA110700
Eurofins | mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	IA110700
Project Name	Bankstown Airport - Site 2
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY (Std) ☐ Other ( )

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

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)			Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar		Sample Comments / DG Hazard Warning
1	A2_TP30_0.2	31/05/16	Soil		X																					
2	A2-TP30-0.5	↓	↓																							
3	A2_TP30_1.0																									
4	A2-TP31-0.0				X																					
5	A2-TP31-0.5																									
6	A2-TP31_1.0																									
7	A2_TP32_0.0				X																					
8	A2_TP32_0.2																									
9	A2_TP32-0.5																									
10	A2-TP32-1.0																									
11	A2-TP33-0.0				X	X	X	X																		
12	A2-TP33_0.2	↓	↓																							

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	1 / 6 / 16	Time	13:45	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__ / __ / __	Time	__:__	Signature		Report №

[illegible]

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Page 3 of 5

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CHAIN OF CUSTODY RECORD

ABN [illegible]

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E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700
Contact Name	Michael Stacey				
Contact Phone №	02 9032 1467				
Special Direction					
Relinquished by	B.Cummings				
(Signature)					
(Time / Date)	15 : 26 1 / 06 / 16				

Project Name	Bankstown Airport - Site 2
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Soil: Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Soil: Eurofins mgt Suite: B13 OCP/ PCB	Soil: Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Soil: Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	Soil: pH (CaCl2)	Soil: Cation Exchange Capacity (CEC)	Soil: % Clay content	Water: Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Water: Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Water: Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				Containers: 1L Plastic	Containers: 250mL Plastic	Containers: 125mL Plastic	Containers: 200mL Amber Glass	Containers: 40mL vial	Containers: 125mL Amber Glass	Containers: Jar	Sample Comments / DG Hazard Warning
1	A2-TP33-0.5	31/05/16	Soil	X																				
2	A2-TP33-1.0	31/05/16	↓																					
3	A2-QC05	↓	↓	X																				
4	A2-QC06	↓	↓	X																				Please forward to ALS
5	A2-QC07	↓	↓	X																				
6	A2-QC08	31/05/16	↓	X																				Please forward to ALS
7	A2-TP34-0.0	1/06/16	↓	X	X	X	X																	
8	A2-TP34-0.3	↓	↓	X																				
9	A2-TP34-0.5	↓	↓																					
10	A2-TP34-1.0	↓	↓																					
11	A2-TP35-0.0	↓	↓	X	X	X																		
12	A2-TP35-0.2	↓	↓				X																	

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	1/6/16	Time	13:45	Signature	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature	Report №

Page 5 of 5

CHAIN OF CUSTODY RECORD

ABN [illegible]

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☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +613 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS	Project Name	Bankstown Airport - Site 2
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote No	160413JACN	Project No	IA110700	Electronic Results Format	ESdat
Contact Name	Michael Stacey					Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Contact Phone No	02 9032 1467					Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* * Surcharges apply ☑ 5DAY (Std) ☐ Other ( )
Special Direction							
Relinquished by (Signature)	B. Cummings					Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal
(Time / Date)	15:20 1/06/16						

Analysis (Note: Where metals are requested, please specify "Total" or "Filtered")

No	Client Sample ID	Date	Matrix	Soil BTEX	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	AZ-TP35-0.5	1/06/16	Soil																							
2	AZ-TP35-1.0	↓	Soil		X																					
3	TS 160517-6	↓	Soil	X																						
4	TB 160517-6	1/06/16	Soil	X																						
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										502799

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	1/6/16	Time	13:45	Signature		Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__/__/__	Time	____	Signature		Report No

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Jacobs Group (Australia) P/L NSW
Level 4, 100 Christie St
St Leonards
NSW 2065

Attention: **Blair Cummings**

Report **505196-W**
Project name BANKSTOWN AIRPORT - SITE 2
Project ID IA110700
Received Date Jun 21, 2016

Client Sample ID			**A2 - GW1**	**A2 - GW2**	**A2 - GW3**	**TS160614 - 16**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Jn19635**	**S16-Jn19636**	**S16-Jn19637**	**S16-Jn19638**
Date Sampled			**Jun 20, 2016**	**Jun 20, 2016**	**Jun 21, 2016**	**Jun 20, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	93%
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	92%
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	92%
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	93%
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	94%
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	93%
4-Bromofluorobenzene (surr.)	1	%	96	93	93	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	-
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
TRH C6-C10 less BTEX (F1)^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	-
TRH >C10-C16 less Naphthalene (F2)^{N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.00001	mg/L	0.00004	0.00001	< 0.00001	-
Perfluorooctanoic acid (PFOA)	0.00001	mg/L	< 0.00001	< 0.00001	< 0.00001	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005	-
13C-PFHxA (surr.)	1	%	120	113	99	-
13C8-PFOS (surr.)	1	%	42	28	21	-
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	0.001	< 0.001	0.002	-
Cadmium (filtered)	0.0001	mg/L	< 0.0001	0.0003	0.0002	-
Chromium (filtered)	0.001	mg/L	0.003	< 0.001	< 0.001	-
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	0.014	-
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	0.018	-
Mercury (filtered)	0.0001	mg/L	0.0001	< 0.0001	< 0.0001	-

Client Sample ID			**A2 - GW1**	**A2 - GW2**	**A2 - GW3**	**TS160614 - 16**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Jn19635**	**S16-Jn19636**	**S16-Jn19637**	**S16-Jn19638**
Date Sampled			**Jun 20, 2016**	**Jun 20, 2016**	**Jun 21, 2016**	**Jun 20, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Nickel (filtered)	0.001	mg/L	0.003	0.034	0.21	-
Zinc (filtered)	0.005	mg/L	< 0.005	0.044	0.17	-

Client Sample ID			**TB160614 - 16**	**A2 - QC09**	**A2 - GW1**	**A2 - GW2**
Sample Matrix			**Water**	**Water**	**Water (Trace)**	**Water (Trace)**
Eurofins | mgt Sample No.			**S16-Jn19639**	**S16-Jn19640**	**S16-Jn19641**	**S16-Jn19642**
Date Sampled			**Jun 20, 2016**	**Jun 21, 2016**	**Jun 20, 2016**	**Jun 20, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	-	< 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	< 0.001	-	-
Toluene	0.001	mg/L	< 0.001	< 0.001	-	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	-	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	-	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	-	-
4-Bromofluorobenzene (surr.)	1	%	93	92	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	-	< 0.01	-	-
TRH C6-C10	0.02	mg/L	-	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	< 0.05	-	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene[N07]	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Phenanthrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	-	-	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	-	-	< 0.00005	< 0.00005
2-Fluorobiphenyl (surr.)	1	%	-	-	101	106
p-Terphenyl-d14 (surr.)	1	%	-	-	104	120

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**TB160614 - 16** **Water** **S16-Jn19639** **Jun 20, 2016**	**A2 - QC09** **Water** **S16-Jn19640** **Jun 21, 2016**	**A2 - GW1** **Water (Trace)** **S16-Jn19641** **Jun 20, 2016**	**A2 - GW2** **Water (Trace)** **S16-Jn19642** **Jun 20, 2016**
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	-	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	-	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	-	< 0.1	-	-
PFOS/PFOA/6:2FTS						
Perfluorooctanesulfonic acid (PFOS)	0.00001	mg/L	-	< 0.00001	-	-
Perfluorooctanoic acid (PFOA)	0.00001	mg/L	-	< 0.00001	-	-
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	0.00005	mg/L	-	< 0.00005	-	-
13C-PFHxA (surr.)	1	%	-	105	-	-
13C8-PFOS (surr.)	1	%	-	26	-	-
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	-	0.002	-	-
Cadmium (filtered)	0.0001	mg/L	-	0.0002	-	-
Chromium (filtered)	0.001	mg/L	-	< 0.001	-	-
Copper (filtered)	0.001	mg/L	-	0.013	-	-
Lead (filtered)	0.001	mg/L	-	0.017	-	-
Mercury (filtered)	0.0001	mg/L	-	< 0.0001	-	-
Nickel (filtered)	0.001	mg/L	-	0.20	-	-
Zinc (filtered)	0.005	mg/L	-	0.17	-	-

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**A2 - GW3** **Water (Trace)** **S16-Jn19643** **Jun 21, 2016**	**A2 - QC09** **Water (Trace)** **S16-Jn19644** **Jun 21, 2016**
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.00001	mg/L	< 0.00001	< 0.00001
Acenaphthylene	0.00001	mg/L	< 0.00001	< 0.00001
Anthracene	0.00001	mg/L	< 0.00001	< 0.00001
Benz(a)anthracene	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(b&j)fluoranthene^{N07}	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001
Chrysene	0.00001	mg/L	< 0.00001	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001	< 0.00001
Fluoranthene	0.00001	mg/L	< 0.00001	< 0.00001
Fluorene	0.00001	mg/L	< 0.00001	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001	< 0.00001
Naphthalene	0.00001	mg/L	< 0.00001	< 0.00001
Phenanthrene	0.00001	mg/L	< 0.00001	< 0.00001
Pyrene	0.00001	mg/L	< 0.00001	< 0.00001
Total PAH*	0.00001	mg/L	< 0.00005	< 0.00005
2-Fluorobiphenyl (surr.)	1	%	99	92
p-Terphenyl-d14 (surr.)	1	%	112	100

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B6 (filtered metals)			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 22, 2016	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jun 21, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 21, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 22, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8 filtered	Sydney	Jun 21, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 22, 2016	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
PFOS/PFOA/6:2FTS	Brisbane	Jun 21, 2016	14 Day
- Method: LTM-ORG-2100 Analysis of PFCs in environmental samples by LC-MS/MS			

Company Name:	Jacobs Group (Australia) P/L NSW	**Order No.:**	IA110700	**Received:**	Jun 21, 2016 5:00 PM
Address:	Level 4, 100 Christie St St Leonards NSW 2065	**Report #:**	505196	**Due:**	Jun 28, 2016
		Phone:	02 9928 2100	**Priority:**	5 Day
		Fax:	02 9928 2504	**Contact Name:**	Blair Cummings
Project Name:	BANKSTOWN AIRPORT - SITE 2				
Project ID:	IA110700				

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Polycyclic Aromatic Hydrocarbons	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B6 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271									
Sydney Laboratory - NATA Site # 18217						X	X		X
Brisbane Laboratory - NATA Site # 20794								X	
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	A2 - GW1	Jun 20, 2016		Water	S16-Jn19635			X	X
2	A2 - GW2	Jun 20, 2016		Water	S16-Jn19636			X	X
3	A2 - GW3	Jun 21, 2016		Water	S16-Jn19637			X	X
4	TS160614 - 16	Jun 20, 2016		Water	S16-Jn19638		X		
5	TB160614 - 16	Jun 20, 2016		Water	S16-Jn19639		X		
6	A2 - QC09	Jun 21, 2016		Water	S16-Jn19640			X	X
7	A2 - GW1	Jun 20, 2016		Water (Trace)	S16-Jn19641	X			
8	A2 - GW2	Jun 20, 2016		Water (Trace)	S16-Jn19642	X			
9	A2 - GW3	Jun 21, 2016		Water (Trace)	S16-Jn19643	X			
10	A2 - QC09	Jun 21, 2016		Water (Trace)	S16-Jn19644	X			

Company Name: Jacobs Group (Australia) P/L NSW
Address: Level 4, 100 Christie St
St Leonards
NSW 2065

Order No.: IA110700
Report #: 505196
Phone: 02 9928 2100
Fax: 02 9928 2504

Received: Jun 21, 2016 5:00 PM
Due: Jun 28, 2016
Priority: 5 Day
Contact Name: Blair Cummings

Project Name: BANKSTOWN AIRPORT - SITE 2
Project ID: IA110700

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail	Polycyclic Aromatic Hydrocarbons	BTEX	PFOS/PFOA/6:2FTS	Eurofins | mgt Suite B6 (filtered metals)
Melbourne Laboratory - NATA Site # 1254 & 14271				
Sydney Laboratory - NATA Site # 18217	X	X		X
Brisbane Laboratory - NATA Site # 20794			X	
External Laboratory				
Test Counts	4	2	4	4

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. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

Units

mg/kg: milligrams per Kilogram	**mg/l:** milligrams per litre
ug/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres	

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. 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.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
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 20-130%

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/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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	mg/L	< 0.00001			0.00001	Pass	
Perfluorooctanoic acid (PFOA)	mg/L	< 0.00001			0.00001	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	mg/L	< 0.00005			0.00005	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0001			0.0001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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 - 1999 NEPM Fractions							
TRH C6-C9	%	78			70-130	Pass	
TRH C10-C14	%	95			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	90			70-130	Pass	
Toluene	%	91			70-130	Pass	
Ethylbenzene	%	93			70-130	Pass	
m&p-Xylenes	%	96			70-130	Pass	
o-Xylene	%	96			70-130	Pass	
Xylenes - Total	%	96			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	84			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	96			70-130	Pass	
Acenaphthylene	%	79			70-130	Pass	
Anthracene	%	109			70-130	Pass	
Benz(a)anthracene	%	105			70-130	Pass	
Benzo(a)pyrene	%	101			70-130	Pass	
Benzo(b&j)fluoranthene	%	116			70-130	Pass	
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	117			70-130	Pass	
Chrysene	%	117			70-130	Pass	
Dibenz(a.h)anthracene	%	99			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	101			70-130	Pass	
Naphthalene	%	119			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	118			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	101			70-130	Pass	
LCS - % Recovery							
PFOS/PFOA/6:2FTS							
Perfluorooctanesulfonic acid (PFOS)	%	114			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	118			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	%	119			50-150	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	98			70-130	Pass	
Cadmium (filtered)	%	104			70-130	Pass	
Chromium (filtered)	%	96			70-130	Pass	
Copper (filtered)	%	97			70-130	Pass	
Lead (filtered)	%	106			70-130	Pass	
Mercury (filtered)	%	99			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel (filtered)			%	99			70-130	Pass	
Zinc (filtered)			%	102			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Jn17400	NCP	%	78			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-Jn17400	NCP	%	92			70-130	Pass	
Toluene	S16-Jn17400	NCP	%	93			70-130	Pass	
Ethylbenzene	S16-Jn17400	NCP	%	95			70-130	Pass	
m&p-Xylenes	S16-Jn17400	NCP	%	97			70-130	Pass	
o-Xylene	S16-Jn17400	NCP	%	97			70-130	Pass	
Xylenes - Total	S16-Jn17400	NCP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Jn17400	NCP	%	89			70-130	Pass	
TRH C6-C10	S16-Jn17400	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M16-Jn21216	NCP	%	105			70-130	Pass	
Cadmium (filtered)	M16-Jn21216	NCP	%	102			70-130	Pass	
Chromium (filtered)	M16-Jn21216	NCP	%	104			70-130	Pass	
Copper (filtered)	M16-Jn21216	NCP	%	85			70-130	Pass	
Lead (filtered)	M16-Jn21216	NCP	%	85			70-130	Pass	
Nickel (filtered)	M16-Jn21216	NCP	%	96			70-130	Pass	
Zinc (filtered)	M16-Jn21216	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S16-Jn19637	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Jn19637	CP	%	102			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Jn19642	CP	%	88			70-130	Pass	
Acenaphthylene	S16-Jn19642	CP	%	83			70-130	Pass	
Anthracene	S16-Jn19642	CP	%	99			70-130	Pass	
Benz(a)anthracene	S16-Jn19642	CP	%	109			70-130	Pass	
Benzo(a)pyrene	S16-Jn19642	CP	%	122			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Jn19642	CP	%	121			70-130	Pass	
Benzo(g.h.i)perylene	S16-Jn19642	CP	%	96			70-130	Pass	
Benzo(k)fluoranthene	S16-Jn19642	CP	%	116			70-130	Pass	
Chrysene	S16-Jn19642	CP	%	108			70-130	Pass	
Dibenz(a.h)anthracene	S16-Jn19642	CP	%	90			70-130	Pass	
Fluoranthene	S16-Jn19642	CP	%	110			70-130	Pass	
Fluorene	S16-Jn19642	CP	%	89			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Jn19642	CP	%	94			70-130	Pass	
Naphthalene	S16-Jn19642	CP	%	105			70-130	Pass	
Phenanthrene	S16-Jn19642	CP	%	93			70-130	Pass	
Pyrene	S16-Jn19642	CP	%	112			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-Jn17399	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S16-Jn19635	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S16-Jn19635	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S16-Jn19635	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Jn17399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S16-Jn17399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S16-Jn17399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S16-Jn17399	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S16-Jn17399	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S16-Jn17399	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Jn17399	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S16-Jn17399	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Jn19635	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S16-Jn19635	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S16-Jn19635	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M16-Jn21215	NCP	mg/L	0.011	0.012	3.0	30%	Pass	
Cadmium (filtered)	M16-Jn21215	NCP	mg/L	0.0002	0.0002	<1	30%	Pass	
Chromium (filtered)	M16-Jn21215	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M16-Jn21215	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	M16-Jn21215	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	M16-Jn21215	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M16-Jn21215	NCP	mg/L	0.034	0.034	1.0	30%	Pass	
Zinc (filtered)	M16-Jn21215	NCP	mg/L	0.050	0.052	3.0	30%	Pass	
Duplicate									
PFOS/PFOA/6:2FTS				Result 1	Result 2	RPD			
Perfluorooctanesulfonic acid (PFOS)	S16-Jn19636	CP	mg/L	0.00001	0.00001	2.0	30%	Pass	
Perfluorooctanoic acid (PFOA)	S16-Jn19636	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTS)	S16-Jn19636	CP	mg/L	< 0.00005	< 0.00005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Acenaphthylene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Anthracene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benz(a)anthracene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(a)pyrene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Chrysene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluoranthene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluorene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Naphthalene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Phenanthrene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Pyrene	S16-Jn19641	CP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Andrew Black	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Jonathon Angell	Senior Analyst-Organic (QLD)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (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.

Sample Receipt Advice

Company name:	**Jacobs Group (Australia) P/L NSW**
Contact name:	Blair Cummings
Project name:	BANKSTOWN AIRPORT - SITE 2
Project ID:	IA110700
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 21, 2016 5:00 PM
Eurofins | mgt reference:	**505196**

Sample information

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

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

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

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

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

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

Results will be delivered electronically via e.mail to Blair Cummings - Blair.Cummings@jacobs.com.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins | mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins | mgt Brisbane Lab
Unit 1 21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600
E EnviroSampleQLD@eurofins.com.au

☐ Eurofins | mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IA110700	Project Manager	Blair Cummings
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700
Contact Name	Michael Stacey				
Contact Phone №	02 9032 1467				
Special Direction					
Relinquished by (Signature)	B. Cummings				
(Time / Date)	17 : 10 21 / 06 / 16				

Project Name: Bankstow Airport - Site 2

Electronic Results Format: ESdat

Email for Results: Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com

Turn Around Requirements: ☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY(Std) ☐ Other ( )
* Surcharges apply

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

№	Client Sample ID	Date	Matrix	Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"] Soil	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001% w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	BTEX		Containers 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2-GW1	20/06/16	Water										X	X	X										
2	A2-GW2	20/06/16											X	X	X										
3	A2-GW3	21/06/16											X	X	X										
4	TS160614-16	20/06/16														X									
5	TB160614-16	20/06/16														X									
6	A2-QC09	21/06/16	Water										X	X	X										
7	[illegible]		[illegible]																						
8																									
9																									
10																									
11																									
12																									

Laboratory Use Only	Received By	Scott Gwlsh.	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	21/06/16	Time	19 : 00	Signature		Temperature	0.1
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	__ / __ / __	Time	__ : __	Signature		Report №	505196

CERTIFICATE OF ANALYSIS

Work Order	: **EM1606431**	Page	: 1 of 6
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Contact	: Carol Walsh
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 02 9928 2100	Telephone	: +61-3-8549 9608
Project	: IA110700	Date Samples Received	: 02-Jun-2016 12:45
Order number	: ----	Date Analysis Commenced	: 03-Jun-2016
C-O-C number	: ----	Issue Date	: 08-Jun-2016 12:05
Sampler	: ----		
Site	: Bankstown Airport - Site 2		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED
ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**A2-QC06**	**A2-QC08**	**----**	**----**	**----**
			Client sampling date / time	[31-May-2016]	[31-May-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1606431-001**	**EM1606431-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	**10.3**	**9.6**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**5**	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**11**	**10**	----	----	----
Copper	7440-50-8	5	mg/kg	<5	**12**	----	----	----
Lead	7439-92-1	5	mg/kg	**13**	**15**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	**8**	----	----	----
Zinc	7440-66-6	5	mg/kg	<5	**18**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**A2-QC06**	**A2-QC08**	**----**	**----**	**----**
			Client sampling date / time	[31-May-2016]	[31-May-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1606431-001**	**EM1606431-002**	--------	--------	--------
				Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**99.7**	**99.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**100**	**99.6**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**71.1**	**70.4**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**98.5**	**98.4**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**119**	**116**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**109**	**112**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**101**	**98.3**	----	----	----
Toluene-D8	2037-26-5	0.2	%	**86.5**	**81.1**	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			Client sample ID	**A2-QC06**	**A2-QC08**	**----**	**----**	**----**
			Client sampling date / time	[31-May-2016]	[31-May-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EM1606431-001**	**EM1606431-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	**101**	**97.3**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	54	125
2-Chlorophenol-D4	93951-73-6	65	123
2.4.6-Tribromophenol	118-79-6	34	122
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	61	125
Anthracene-d10	1719-06-8	62	130
4-Terphenyl-d14	1718-51-0	67	133
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	51	125
Toluene-D8	2037-26-5	55	125
4-Bromofluorobenzene	460-00-4	56	124

Environmental

QUALITY CONTROL REPORT

Work Order	: **EM1606431**	Page	: 1 of 7
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Contact	: Carol Walsh
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: +61 02 9928 2100	Telephone	: +61-3-8549 9608
Project	: IA110700	Date Samples Received	: 02-Jun-2016
Order number	: ----	Date Analysis Commenced	: 03-Jun-2016
C-O-C number	: ----	Issue Date	: 08-Jun-2016
Sampler	: ----		
Site	: Bankstown Airport - Site 2		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED
ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 474442)									
EM1606424-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	22.2	21.2	4.83	0% - 20%
EM1606434-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	8.1	6.7	18.8	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 474725)									
EM1606400-015	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	7	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	6	31.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	145	122	17.2	0% - 20%
EM1606400-024	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	1	1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	8	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	11	13.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	12	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	32	26	20.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 474726)									
EM1606400-015	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EM1606400-024	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 474677)									
EM1606429-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 474677) - continued									
EM1606429-001	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 474335)									
EM1606411-036	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EM1606437-005	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 474676)									
EM1606426-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1606429-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 474335)									
EM1606411-036	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EM1606437-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 474676)									
EM1606426-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EM1606429-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
		EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 474335)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 474335) - continued									
EM1606411-036	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EM1606437-005	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 474725)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	88.4	79	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	100	87	115
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.8	89	113
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	99.4	90	116
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.9	85	107
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	89	111
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	99.3	89	111
EG035T: Total Recoverable Mercury by FIMS (QCLot: 474726)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	92.4	85	103
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 474677)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	3 mg/kg	101	80	121
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3 mg/kg	93.1	70	130
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	3 mg/kg	110	80	120
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	3 mg/kg	104	70	124
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3 mg/kg	106	80	122
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	3 mg/kg	111	80	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3 mg/kg	106	70	128
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	3 mg/kg	105	80	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	3 mg/kg	88.6	70	130
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	3 mg/kg	103	80	126
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	3 mg/kg	88.7	70	124
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	3 mg/kg	88.5	75	125
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	3 mg/kg	85.2	65	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	3 mg/kg	78.8	65	128
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	3 mg/kg	75.6	65	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3 mg/kg	78.1	65	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474335)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	36 mg/kg	106	66	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474676)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	751 mg/kg	94.5	65	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	3103 mg/kg	94.4	70	126
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	1482 mg/kg	111	70	122
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474335)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	45 mg/kg	104	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474676)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	1135 mg/kg	95.0	68	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	4080 mg/kg	98.0	72	116
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	162 mg/kg	106	38	132
EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN (QCLot: 474335)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	112	74	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	113	75	129
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	108	72	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	113	72	132
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	113	76	130
EP080: Naphthalene	91-20-3	1	mg/kg	<1	0.5 mg/kg	110	66	132

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 474725)							
EM1606400-016	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.9	78	124
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.8	84	116
		EG005T: Chromium	7440-47-3	50 mg/kg	91.2	79	121
		EG005T: Copper	7440-50-8	50 mg/kg	90.7	82	124
		EG005T: Lead	7439-92-1	50 mg/kg	82.8	76	124
		EG005T: Nickel	7440-02-0	50 mg/kg	86.4	78	120
		EG005T: Zinc	7440-66-6	50 mg/kg	# Not Determined	74	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 474726)							
EM1606400-016	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.2	76	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 474677)							
EM1606429-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	3 mg/kg	102	67	117
		EP075(SIM): Pyrene	129-00-0	3 mg/kg	142	52	148
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474335)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474335) - continued							
EM1606411-040	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	79.5	42	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 474676)							
EM1606426-002	Anonymous	EP071: C10 - C14 Fraction	----	751 mg/kg	97.7	53	123
		EP071: C15 - C28 Fraction	----	3103 mg/kg	95.4	70	124
		EP071: C29 - C36 Fraction	----	1482 mg/kg	111	64	118
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474335)							
EM1606411-040	Anonymous	EP080: C6 - C10 Fraction	C6_C10	33 mg/kg	73.9	39	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 474676)							
EM1606426-002	Anonymous	EP071: >C10 - C16 Fraction	----	1135 mg/kg	96.2	65	123
		EP071: >C16 - C34 Fraction	----	4080 mg/kg	98.7	67	121
		EP071: >C34 - C40 Fraction	----	162 mg/kg	116	44	126
EP080: BTEXN (QCLot: 474335)							
EM1606411-040	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	124	50	136
		EP080: Toluene	108-88-3	2 mg/kg	120	56	139

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM1606431**	Page	: 1 of 4
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Telephone	: +61-3-8549 9608
Project	: IA110700	Date Samples Received	: 02-Jun-2016
Site	: Bankstown Airport - Site 2	Issue Date	: 08-Jun-2016
Sampler	: ----	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EM1606400--016	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) A2-QC06, A2-QC08	**31-May-2016**	**----**	----	----	**03-Jun-2016**	14-Jun-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) A2-QC06, A2-QC08	**31-May-2016**	**06-Jun-2016**	27-Nov-2016	✓	**07-Jun-2016**	27-Nov-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) A2-QC06, A2-QC08	**31-May-2016**	**06-Jun-2016**	28-Jun-2016	✓	**07-Jun-2016**	28-Jun-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) A2-QC06, A2-QC08	**31-May-2016**	**06-Jun-2016**	14-Jun-2016	✓	**06-Jun-2016**	16-Jul-2016	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) A2-QC06, A2-QC08	**31-May-2016**	**06-Jun-2016**	14-Jun-2016	✓	**06-Jun-2016**	16-Jul-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) A2-QC06, A2-QC08	**31-May-2016**	**03-Jun-2016**	14-Jun-2016	✓	**03-Jun-2016**	14-Jun-2016	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM1606431**

Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: BLAIR CUMMINGS	Contact	: Carol Walsh
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: blair.cummings@jacobs.com	E-mail	: carol.walsh@alsglobal.com
Telephone	: +61 02 9928 2100	Telephone	: +61-3-8549 9608
Facsimile	: +61 02 9928 2272	Facsimile	: +61-3-8549 9601
Project	: IA110700	Page	: 1 of 2
Order number	: ----	Quote number	: EP2016SINKNI0001 (EP/2013/15 WABQ)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Bankstown Airport - Site 2		
Sampler	:		

Dates

Date Samples Received	: 02-Jun-2016 12:45 PM	Issue Date	: 02-Jun-2016
Client Requested Due Date	: 09-Jun-2016	Scheduled Reporting Date	: **09-Jun-2016**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 6.2°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-26 8 metals/TRH/BTEXN/PAH
EM1606431-001	[31-May-2016]	A2-QC06	✓	✓
EM1606431-002	[31-May-2016]	A2-QC08	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	au-ap@jacobs.com

BLAIR CUMMINGS

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

MICHAEL STACEY (JACOB)

- *AU Certificate of Analysis - NATA (COA)	Email	michael.stacey@jacobs.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	michael.stacey@jacobs.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	michael.stacey@jacobs.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	michael.stacey@jacobs.com
- Chain of Custody (CoC) (COC)	Email	michael.stacey@jacobs.com
- EDI Format - ENMRG (ENMRG)	Email	michael.stacey@jacobs.com
- EDI Format - ESDAT (ESDAT)	Email	michael.stacey@jacobs.com
- EDI Format - XTab (XTAB)	Email	michael.stacey@jacobs.com

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☑ Eurofins mgt Sydney Lab
Unit F3 Building F 16 Mars Rd Lane Cove West NSW 2066 P +612 9900 8400
E EnviroSampleNSW@eurofins.com.au

☐ Eurofins mgt Brisbane Lab
Unit 1 21 Smallwood Place Murarrie QLD 4172 P +617 3902 4600
EnviroSampleQLD@eurofins.com.au

☐ Eurofins mgt Melbourne Lab
2 Kingston Town Close Oakleigh VIC 3166 P +61 3 8564 5000 F +61 3 8564 5090
E EnviroSampleVic@eurofins.com.au

Company	Jacobs
Address	Level 4 100 Christie Street St Leonards NSW 2065
Contact Name	Michael Stacey
Contact Phone №	02 9032 1467
Special Direction	
Relinquished by	B. Cummings
(Signature)	
(Time / Date)	15 : 26 1 / 06 / 16
Purchase Order	IA110700
Eurofins mgt Quote №	160413JACN
Project Manager	BLAIR CUMMINGS
Project №	IA110700
Project Name	Bankstown Airport - Site 2
Electronic Results Format	ESdat
Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* ☑ 5DAY (Std) ☐ Other ( ) * Surcharges apply
Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis (Note: where metals are requested, please specify "Total" or "Filtered")

№	Client Sample ID	Date	Matrix	Soil: Eurofins mgt Suite: B7 TRH BTEXN PAH As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA NEPM Guidelines - Quantitative (0.001% W/W)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water: Eurofins mgt Suite: B6 TRH BTEXN As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Containers: 1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2-TP33-0.5	31/05/16	Soil	X																	
2	A2-TP33-1.0	31/05/16																			
3	A2-QC05			X																	
4	① ~~A2-QC06~~			X																	Please forward to ALS
5	A2-QC07			X																	
6	② ~~A2-QC08~~	31/05/16		X																	Please forward to ALS
7	A2-TP34-0.0	1/06/16		X	X	X	X														
8	A2-TP34-0.3			X																	RJ
9	A2-TP34-0.5																				
10	A2-TP34-1.0																				CR
11	A2-TP35-0.0			X	X	X															02/06/16
12	A2-TP35-0.2						X														

Environmental Division
Melbourne
Work Order Reference
EM1606431

Telephone : +61-3-8549 9600

Laboratory Use Only	Received By	SS	SYD | BNE | MEL | PER | ADL | NEW | DAR	Date	1.6.16	Time	15:30	Signature	Temperature
	Received By		SYD | BNE | MEL | PER | ADL | NEW | DAR	Date		Time		Signature	Report №

CERTIFICATE OF ANALYSIS

Work Order	: **ES1611169**	Page	: 1 of 6
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL STACEY (JACOB)	Contact	:
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9928 2100	Telephone	: +61-2-8784 8555
Project	: Bankstown Airport - Site 2	Date Samples Received	: 24-May-2016 15:50
Order number	: IA110700	Date Analysis Commenced	: 25-May-2016
C-O-C number	: ----	Issue Date	: 30-May-2016 12:14
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

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ISO/IEC 17025.

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ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	A2 - QC02	A2 - QC04	----	----	----
			Client sampling date / time	[20-May-2016]	[20-May-2016]	----	----	----
Compound	CAS Number	LOR	Unit	ES1611169-001	ES1611169-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	**4.0**	**6.9**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**9**	**6**	----	----	----
Copper	7440-50-8	5	mg/kg	<5	<5	----	----	----
Lead	7439-92-1	5	mg/kg	**183**	**10**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	<5	<5	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)			*Client sample ID*	**A2 - QC02**	**A2 - QC04**	----	----	----
			Client sampling date / time	[20-May-2016]	[20-May-2016]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1611169-001**	**ES1611169-002**	--------	--------	--------
				Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg	<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	<50	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**95.5**	**102**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**94.6**	**88.7**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**107**	**108**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**103**	**99.9**	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**86.5**	**84.7**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**97.9**	**94.0**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**125**	**124**	----	----	----
Toluene-D8	2037-26-5	0.2	%	**128**	**130**	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL)**			Client sample ID	**A2 - QC02**	**A2 - QC04**	**----**	**----**	**----**
			Client sampling date / time	[20-May-2016]	[20-May-2016]	----	----	----
Compound	CAS Number	LOR	Unit	**ES1611169-001**	**ES1611169-002**	**--------**	**--------**	**--------**
				Result	Result	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	**113**	**106**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **SOIL**

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

QUALITY CONTROL REPORT

Work Order	: **ES1611169**	Page	: 1 of 7
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL STACEY (JACOB)	Contact	:
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9928 2100	Telephone	: +61-2-8784 8555
Project	: Bankstown Airport - Site 2	Date Samples Received	: 24-May-2016
Order number	: IA110700	Date Analysis Commenced	: 25-May-2016
C-O-C number	: ----	Issue Date	: 30-May-2016
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 2		
No. of samples analysed	: 2		

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WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 464647)									
ES1611137-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	8.3	8.5	2.36	No Limit
ES1611178-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	3.0	2.6	12.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 466492)									
ES1610540-027	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	35	22	46.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	27	25	7.90	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	5	34.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	7	56.7	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	12	35.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	48	36	27.0	No Limit
ES1611169-001	A2 - QC02	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	9	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	183	165	10.6	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 466493)									
ES1610540-027	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1611169-001	A2 - QC02	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 464257)									
ES1611137-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 464257) - continued									
ES1611137-001	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 464255)									
ES1611137-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 464638)									
ES1611137-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1611178-010	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 464255)									
ES1611137-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 464638)									
ES1611137-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1611178-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 464638)									
ES1611137-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix**: SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 464638) - continued									
ES1611178-010	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	*Laboratory Control Spike (LCS) Report*			
					Spike	*Spike Recovery (%)*	*Recovery Limits (%)*	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EG005T: Total Metals by ICP-AES (QCLot: 466492)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	95.8	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.7	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	93.7	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	103	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.2	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	99.9	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 466493)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	96.1	70	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 464257)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	92.7	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	91.6	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	95.7	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	90.6	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	95.5	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	89.9	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	93.3	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.5	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.6	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	94.5	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	93.4	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	91.8	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.6	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	92.1	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	96.3	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	93.9	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 464255)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	92.8	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	103	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	96.1	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 464638)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	97.3	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 464255)								

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 464255) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	99.6	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	108	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	97.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 464638)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	97.5	68	128
EP080: BTEXN (QCLot: 464638)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	104	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.5	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.7	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	92.0	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	97.4	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 466492)							
ES1610540-030	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	98.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.5	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	74.7	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	102	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	93.9	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	85.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	91.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 466493)							
ES1610540-027	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	107	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 464257)							
ES1611137-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	81.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	79.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 464255)							
ES1611137-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	81.6	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	99.0	53	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 464255) - continued							
ES1611137-001	Anonymous	EP071: C29 - C36 Fraction	----	1714 mg/kg	111	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 464638)							
ES1611137-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	88.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 464255)							
ES1611137-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	86.7	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	102	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	112	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 464638)							
ES1611137-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	85.9	70	130
EP080: BTEXN (QCLot: 464638)							
ES1611137-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	91.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	88.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	85.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	85.1	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	86.4	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	82.5	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1611169**	Page	: 1 of 4
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL STACEY (JACOB)	Telephone	: +61-2-8784 8555
Project	: Bankstown Airport - Site 2	Date Samples Received	: 24-May-2016
Site	: ----	Issue Date	: 30-May-2016
Sampler	: ----	No. of samples received	: 2
Order number	: IA110700	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) A2 - QC02, A2 - QC04	**20-May-2016**	**----**	----	----	**25-May-2016**	03-Jun-2016	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) A2 - QC02, A2 - QC04	**20-May-2016**	**26-May-2016**	16-Nov-2016	✓	**27-May-2016**	16-Nov-2016	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) A2 - QC02, A2 - QC04	**20-May-2016**	**26-May-2016**	17-Jun-2016	✓	**27-May-2016**	17-Jun-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) A2 - QC02, A2 - QC04	**20-May-2016**	**25-May-2016**	03-Jun-2016	✓	**26-May-2016**	04-Jul-2016	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) A2 - QC02, A2 - QC04	**20-May-2016**	**25-May-2016**	03-Jun-2016	✓	**26-May-2016**	04-Jul-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) A2 - QC02, A2 - QC04	**20-May-2016**	**25-May-2016**	03-Jun-2016	✓	**25-May-2016**	03-Jun-2016	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES1611169**		
Client	: **JACOBS GROUP (AUSTRALIA) PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR MICHAEL STACEY (JACOB)	Contact	:
Address	: 100 CHRISTIE STREET P O BOX 164 ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: michael.stacey@jacobs.com	E-mail	:
Telephone	: +61 02 9928 2100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9928 2272	Facsimile	: +61-2-8784 8500
Project	: Bankstown Airport - Site 2	Page	: 1 of 2
Order number	: IA110700	Quote number	: EP2016SINKNI0001 (EP/2013/15 WABQ)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 24-May-2016 3:50 PM	Issue Date	: 24-May-2016
Client Requested Due Date	: 30-May-2016	Scheduled Reporting Date	: **30-May-2016**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 9.3
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA055-103 Moisture Content	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1611169-001	[20-May-2016]	A2 - QC02	✓	✓
ES1611169-002	[20-May-2016]	A2 - QC04	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE (Brisbane)		
- A4 - AU Tax Invoice (INV)	Email	au-ap@jacobs.com
BLAIR CUMMINGS		
- *AU Certificate of Analysis - NATA (COA)	Email	blair.cummings@jacobs.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	blair.cummings@jacobs.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	blair.cummings@jacobs.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	blair.cummings@jacobs.com
- Chain of Custody (CoC) (COC)	Email	blair.cummings@jacobs.com
- EDI Format - ENMRG (ENMRG)	Email	blair.cummings@jacobs.com
- EDI Format - ESDAT (ESDAT)	Email	blair.cummings@jacobs.com
- EDI Format - XTab (XTAB)	Email	blair.cummings@jacobs.com
MICHAEL STACEY (JACOB)		
- *AU Certificate of Analysis - NATA (COA)	Email	michael.stacey@jacobs.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	michael.stacey@jacobs.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	michael.stacey@jacobs.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	michael.stacey@jacobs.com
- Chain of Custody (CoC) (COC)	Email	michael.stacey@jacobs.com
- EDI Format - ENMRG (ENMRG)	Email	michael.stacey@jacobs.com
- EDI Format - ESDAT (ESDAT)	Email	michael.stacey@jacobs.com
- EDI Format - XTab (XTAB)	Email	michael.stacey@jacobs.com

CHAIN OF CUSTODY RECORD
ABN 60 005 085 521

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Company	Jacobs	Purchase Order	IA110700	Project Manager	BLAIR CUMMINGS
Address	Level 4 100 Christie Street St Leonards NSW 2065	Eurofins | mgt Quote №	160413JACN	Project №	IA110700
Contact Name	Michael Stacey			Project Name	Bankstown Airport - Site 2
Contact Phone №	02 9032 1467			Electronic Results Format	ESdat
Special Direction				Email for Results	Michael.Stacey@jacobs.com, Blair.Cummings@jacobs.com
Relinquished by (Signature) (Time / Date)	B. Cummings 19:10 20/05/16			Turn Around Requirements	☐ 1DAY* ☐ 2DAY* ☐ 3DAY* *Surcharges apply ☑ 5 DAY (Std) ☐ Other ( )
				Method of Shipment	☐ Courier ( ) ☑ Hand Delivered ☐ Postal

Analysis [Note: Where metals are requested, please specify "Total" or "Filtered"]

№	Client Sample ID	Date	Matrix	Soil BTEX	Eurofins mgt Suite: B7 TRH/ BTEXN/ PAH/ As, Cd, Cr, Cu, Ni Pb, Zn, Hg	Eurofins mgt Suite: B13 OCP/ PCB	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)	Asbestos - WA/NEPM Guidelines - Quantitative (0.001%w/w)	pH (CaCl2)	Cation Exchange Capacity (CEC)	% Clay content	Water	Eurofins mgt Suite: B6 TRH/ BTEXN/ As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Polycyclic Aromatic Hydrocarbons (PAH) - Trace Level	Perfluorooctanoic acid (PFOA) / Perfluorooctanesulfonic acid (PFOS) / 6:2 fluorotelomer sulfonate (6:2 FTS)				1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL vial	125mL Amber Glass	Jar	Sample Comments / DG Hazard Warning
1	A2_TP19_0.0	20/05/16	Soil																							
2	A2-TP19_0.2				X																					
3	A2-TP19-0.5																									
4	A2-TP19-1.0																									
5	A2-TP20_0.0				X	X	X	X																		
6	A2-TP20-0.5																									
7	A2-TP20-1.0				X																					
8	A2-QC01				X																					
9	A2-QC02 1				X																					Please forward to ALS
10	A2-QC03				X																					
11	A2-QC04 2				X																					Please forward to ALS
12	TS 160517-1			X																						

Laboratory Use Only	Received By	SS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	20/5/16	Time	--:--	Signature		Temperature	9.5	C
	Received By	Frank ALS	[✓ SYD] | BNE | MEL | PER | ADL | NEW | DAR	Date	24/5/16	Time	15.50	Signature		Report №	9	

Environmental Division
Sydney
Work Order Reference
ES1611169

Telephone : + 61-2-8784 8555

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

Relin by Sean 24/5 10:00

Page 6 of 7

ENVIROLAB GROUP
ENVIROLAB SERVICES
mpl Laboratories

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 151807

Client:

Jacobs Group (Australia) Pty Ltd
100 Christie St
St Leonards
NSW 2065

Attention: M Stacey, B Cummings

Sample log in details:

Your Reference:	**IA110700**		
No. of samples:	4 Soils		
Date samples received / completed instructions received	15/08/2016	/	15/08/2016

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: / Issue Date:	22/08/16	/	19/08/16
Date of Preliminary Report:	Not Issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

Asbestos ID - soils NEPM - ASB-001					
Our Reference:	UNITS	151807-1	151807-2	151807-3	151807-4
Your Reference	------------- -	A2-TP17 N	A2-TP17 E	A2-TP17 S	A2-TP17 W
Date Sampled	------------	12/08/2016	12/08/2016	12/08/2016	12/08/2016
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	19/08/2016	19/08/2016	19/08/2016	19/08/2016
Sample mass tested	g	1365.6	1782.3	1881.5	1925.7
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (as per AS4964)	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected Synthetic mineral fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	Chrysotile Amosite	Not applicable	Not applicable	Not applicable
ACM >7mm Estimation*	g	0.0000	0.0000	0.0000	0.0000
FA and AF Estimation*	g	0.0196	0.0000	0.0000	0.0000
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*[#2]	%(w/w)	0.0014	<0.001	<0.001	<0.001

Method ID	Methodology Summary
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.
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.

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.

Asbestos ID was analysed by Approved Identifier:	Paul Ching
Asbestos ID was authorised by Approved Signatory:	Paul Ching

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

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.

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.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Jacobs Group (Australia) Pty Ltd
Attention	M Stacey, B Cummings

Sample Login Details	
Your Reference	IA110700
Envirolab Reference	**151807**
Date Sample Received	15/08/2016
Date Instructions Received	15/08/2016
Date Results Expected to be Reported	**22/08/2016**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	4 Soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	NA
Cooling Method	Not applicable
Sampling Date Provided	

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

Please direct any queries to:

Aileen Hie	**Jacinta Hurst**
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolabservices.com.au	Email: jhurst@envirolabservices.com.au

Sample and Testing Details on following page

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

Sample Id	***Asbestos ID - soils NEPM - ASB-001***
A2-TP17 N	✓
A2-TP17 E	✓
A2-TP17 S	✓
A2-TP17 W	✓

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National Phone number 1300 42 43 44

22516

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
Ph 03 9763 2500 / melbourne@envirolab.com.au

Brisbane Lab - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph 07 3266 9532 / brisbane@envirolab.com.au

Adelaide Lab - Envirolab Services
7 Palmerton Road Windsor Gardens, SA 5087
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: Jacobs
Contact Person: M. Stacey
Project Mgr: B. Cummings
Sampler: M. Grasso
Address: 100 Christie St
St Leonards NSW 2065
Phone: 9032 1467 **Mob:** 0406 861 835
Fax:
Email: michael.stacey@jacobs.com

Client Project Name / Number / Site etc (ie report title): IA110700
PO No.:
Envirolab Quote No. :
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
Lab comments:

Sample information					Tests Required	Comments
Envirolab Sample ID	**Client Sample ID or information**	**Depth**	**Date sampled**	**Type of sample**	WA Pot + Asbestos	**Provide as much information about the sample as you can**
1	A2-TP17 N	Surface	12 August 16	Soil	✓	
2	A2-TP17 E				✓	
3	A2-TP17 S				✓	
4	A2-TP17 W				✓	

ENVIROLAB Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 151807
Date Received: 15/8
Time Received: 1130
Received by: PH
Temp: Cool/[✓ Ambient]
Cooling: Ice/Icepack
Security: [✓ Intact]/Broken/None

Relinquished by (company): Jacobs
Print Name: Michael Stacey
Date & Time: 15.8.16 | 9:15am
Signature:

Received by (company): ELS
Print Name: PH
Date & Time: 15/8 1130
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: **(if applicable)**
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

Page No: 1 of 1

Form: 302 - Chain of Custody-Client, Issued 22/05/12, Version 5, Page 1 of 1.