

Meadowbank Education and Employment Precinct Schools Project Supplementary Contamination Assessment

SSD 18_9343

Prepared by Alliance Geotechnical



For School Infrastructure NSW

11 October 2019



DOCUMENT CONTROL

Revision	Date	Author	Reviewer
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Rev 1	11 October 2019	Sam Scully	Aidan Rooney

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EXECUTIVE SUMMARY

Alliance Geotechnical Pty Ltd (AG) was engaged by Ward Civil, to undertake a Supplementary Contamination Assessment for Meadowbank Education and Employment Precinct Schools Project at 2 Rhodes Street, Meadowbank, NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

This report has been prepared by AG on behalf of the NSW Department of Education (the Applicant). It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD 18_9343) for the Meadowbank Education and Employment Precinct Schools Project (hereafter referred to as MEEPSP) at 2 Rhodes Street, Meadowbank (the site).

MEEPSP will cater for 1,000 primary school students and 1,620 high school students. The proposal seeks consent for:

- A multi-level, multi-purpose, integrated school building with a primary school wing and high school wing. The school building is connected by a centralised library that is embedded into the landscape. The school building contains:
 - Collaborative general and specialist learning hubs, with a combination of enclosed and open spaces;
 - Adaptable classroom home bases;
 - Four level central library, with primary school library located on ground floor and high school library on levels 1 to 3.
 - Laboratories and workshops;
 - Staff workplaces;
 - Canteens;
 - Indoor gymnasium;
 - Multipurpose communal hall;
 - Outdoor learning, play and recreational areas (both covered and uncovered).
- Associated site landscaping and public domain improvements;
- An on-site car park for 60 parking spaces; and
- Construction of ancillary infrastructure and utilities as required.

The objectives of this investigation were to:

- Assess data gaps and delineate the identified contamination presented in the Stage 2 Detailed Site Investigation (DSI) completed by AG in 2018 (AG, 2018b) and the remedial action plan (RAP) completed by AG in 2018 (AG, 2018c);
- Assess the potential nature and extent of identified contaminants of potential concern on the site, with reference to the areas of environmental concern reported by AG in (AG, 2018b & AG, 2018c);
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting;
- Provide recommendations for further investigation, management and/or remediation (if warranted).

The scope of works undertaken to address the investigation objectives, included:

- A desktop review of relevant information relating to the site;
- A site walkover to understand current site conditions;
- Conduct an intrusive site investigation using both excavator and utility-mounted drill rig to assess subsurface ground conditions and to facilitate the collection of representative soil samples;
- Laboratory analysis to compliment the in-situ testing completed during the field investigation; and
- Data assessment and report preparation.

Conclusions and Recommendations

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

Data Gap Assessment (previously inaccessible areas)

- the detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable direct contact human health exposure risk;
- fibrous asbestos and asbestos fines detected in the soils assessed, may present an unacceptable human health exposure risk, at sampling points **TP53** and **TP57**;
- the detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable inhalation / vapour intrusion human health exposure risk; and
- the detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present a petroleum hydrocarbon management limit risk.

Chemical Delineation Assessment

- the extent of previously identified lead contamination at sampling points **BH02**, **BH22** and **BH24**, is considered to have been adequately delineated; and
- the extent of previously identified benzo(a)pyrene contamination at sampling points **BH04**, **BH16** and **BH23**, is considered to have been adequately delineated.

Asbestos Delineation Assessment

- the extent of previously identified asbestos contamination at sampling points **SS02**, **SS03**, **BH30**, **BH40**, **BH41** and **TP53** is considered to have been adequately delineated;
- the extent of previously identified asbestos contamination at sampling point **BH07**, has not been adequately delineated; and
- Non-friable ACM identified at sampling point **TP04B** may present an unacceptable human health exposure risk and has not been adequately delineated.

Indicative Waste Classification

- General Solid Waste (Special Waste).

Based on these conclusions, AG makes the following recommendations:

-
- a further supplementary contamination assessment could be undertaken to further understand the nature and extent of asbestos contamination identified at sampling points **TP04B, TP07A** and **TP57**; or
 - alternatively, AG (2018c) could be updated to include the recently identified contamination risks onsite and outline the appropriate remedial measures to adequately remove the contamination pathway and associated human health exposure risks. It is recommended that any update to AG (2018c) be undertaken by an appropriately experienced environmental consultant.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 15**.

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LIST OF ABBREVIATIONS

A list of the common abbreviations used throughout this report is provided below:

ACM	Asbestos Containing Material
AF/FA	Asbestos Fines / Fibrous Asbestos
AEC	Area of Environmental Concern
AG	Alliance Geotechnical Pty Ltd
AHD	Australian Height Datum
B(a)P TEQ	Benzo(a)pyrene Toxic Equivalence Quotient
BTEX	Benzene, toluene, ethyl benzene and xylenes
COPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
DP	Deposited Plan
EPA	NSW Environment Protection Authority
m	metres
m ²	square metres
m bgs	metres below ground surface
mg/kg	milligrams per kilogram
OCP	Organochlorine pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PSI	Preliminary Site Investigation
RAP	Remedial Action Plan
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit

1. INTRODUCTION

1.1. Background

Alliance Geotechnical Pty Ltd (AG) was engaged by Ward Civil, to undertake a supplementary contamination assessment (SCA) for Meadowbank Education and Employment Precinct Schools Project at 2 Rhodes Street, Meadowbank, NSW (refer **Figure 1** with the 'site' boundaries outlined in **Figure 2**).

This report has been prepared by AG on behalf of the NSW Department of Education (the Applicant). It accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD 18_9343) for the Meadowbank Education and Employment Precinct Schools Project (hereafter referred to as MEEPSP) at 2 Rhodes Street, Meadowbank (the site).

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 - Laboratories and workshops;
 - Staff workplaces;
 - Canteens;
 - Indoor gymnasium;
 - Multipurpose communal hall;
 - Outdoor learning, play and recreational areas (both covered and uncovered).
- Associated site landscaping and public domain improvements;
- An on-site car park for 60 parking spaces; and
- Construction of ancillary infrastructure and utilities as required.

1.2. Objectives

The objectives of this project were to:

- Assess data gaps from previous investigations and delineate the identified contamination presented in the Stage 2 – Detailed Site Investigation (DSI) completed by AG in 2018 (AG, 2018b) and the Remedial Action Plan (RAP) completed by AG in 2018 (AG, 2018c);
- Assess the potential nature and extent of identified contaminants of potential concern on the site, with reference to the areas of environmental concern (AECs) reported by AG in (AG, 2018b & AG, 2018c);
- Provide advice on whether the site would be suitable (in the context of land contamination) for the proposed land use setting;

- Provide recommendations for further investigation, management and/or remediation (if warranted).

1.3. Scope of Work

AG undertook the following scope of works to address the project objectives:

- A desktop review of the previous investigation reports and other relevant information relating to the site;
- A site walkover to understand current site conditions;
- Conducted an intrusive site investigation using both excavators and ute-mounted drill rig to assess subsurface ground conditions and to facilitate the collection of representative soil samples;
- Laboratory analysis to compliment the in-situ testing completed during the field investigation; and
- Data assessment and report preparation.

A Supplementary Contamination Assessment is required by the Secretary's Environmental Assessment Requirements (SEARs) for SSD 18_9343. This table identifies the SEARs and relevant reference within this report.

Table 1.1 – SEARs and Relevant Reference

SEARs Item	Report Reference
<u>13 Contamination</u> Assess and quantify any soil and groundwater contamination and demonstrate that the site is suitable for the proposed use in accordance with SEPP 55.	Whole Report

2. SITE IDENTIFICATION

The site is registered with NSW Land and Property Information as a portion of Portion of Lot 1 in DP837179 (Lot 10 in DP1232584).

A registered Lot survey plan of acquisition drawing provided by the client indicates the site is Lot 10 in DP1232584 being part of Lot 1 in DP837179.

The Section 10.7 (formally Section 149) planning certificate for the site (refer Alliance Geotechnical (2018a)) refers to the site as being Lot 10 in DP1232584, with a street address of 2 Rhodes Street, Meadowbank, NSW.

For the purpose of this investigation, the site will be defined as Lot 10 in DP1232584 being part of Lot 1 in DP837179.

The approximate geographic coordinates of the middle of the site, inferred from Google Earth were 33°48'46" S and 151°05'27" E.

The locality of the site is set out in **Figure 1**.

The general layout of the site is set out in **Figure 2**.

The site covers an area of 3.329 hectares (by Lot survey plan).

A copy of a detail and level survey and the Lot plan survey is presented in **Appendix A**.

3. SITE CONDITIONS AND SURROUNDING ENVIRONMENT

3.1. Geology

A review of the Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1) 1983, indicated that the site is underlain by Middle Triassic Hawkesbury Sandstone, which is comprised of medium to coarse grained quartz sandstone, very minor shale and laminite lenses. A portion of the eastern boundary of the site is in close proximity to Ashfield Shale, which is comprised of black to dark grey shale and laminite.

3.2. Acid Sulfate Soils

A review of the Prospect Parramatta Acid Sulfate Soil Risk Map (1:25,000 scale) indicates that the site is in a map class description of ***“No Known Occurrence”***. Land management activities are not likely to be affected by acid sulfate soil materials.

3.3. Topography

The site topography was generally undulating, with overall slopes generally towards the south and south west, and some localised slopes in the northern portion, towards the east.

The detail and level survey presented in **Appendix A** provides further information on surface contours and elevations.

3.4. Hydrogeology

Surface water courses proximal to the site included:

- Parramatta River located approximately 400m to the south of the site.

Based on distances to the nearest surface water course and the site topography, groundwater flow in the vicinity of the site is considered likely to be towards the south.

A review of the NSW Office of Water groundwater database ([www.http://allwaterdata.water.nsw.gov.au/water](http://allwaterdata.water.nsw.gov.au/water)) indicated there are three (3) registered groundwater features located within a 500m radius of the site (GW1048997, GW1048998, and GW1048999):

- GW1048997 with an authorised purpose for “monitoring bore”. The water bearing zone for the feature was at 2.4m and the standing water level in that bore was measured at 2.32m.
- GW1048998 with an authorised purpose for “monitoring bore”. The water bearing zone for the feature was at 2.1m and the standing water level in that bore was measured at 2.5m.
- GW1048999 with an authorised purpose for “monitoring bore”. The water bearing zone for the feature was at 2.4m and the standing water level in that bore was measured at 2.32m.

Each of the three features were located to the west of the site, considered to be in an inferred down or cross gradient location, relative to the site.

4. PREVIOUS CONTAMINATION ASSESSMENTS

The following reports were considered during the undertaking of this project:

- AG 2018a, *'Stage 1 Preliminary Site Investigation, Portion of Lot 1 in DP837179 (Lot 10 in DP1232584), Meadowbank Education and Employment Precinct Schools Project, 2 Rhodes Street, Meadowbank, NSW'*, dated June 2019, ref: 6179-ER-1-1 REV5;
- AG 2018b, *'Stage 2 Detailed Site Investigation, Portion of Lot 1 in DP837179 (Lot 10 in DP1232584), Meadowbank Education and Employment Precinct Schools Project, 2 Rhodes Street, Meadowbank, NSW'*, dated June 2019, ref: 6179-ER-1-2 REV6;
- AG 2018c, *'Remedial Action Plan, Portion of Lot 1 in DP837179 (Lot 10 in DP1232584), Meadowbank Education and Employment Precinct Schools Project, 2 Rhodes Street, Meadowbank, NSW'*, dated 12 June 2019, ref: 6179-ER-1-3 REV5.

A summary of these reports is presented in **Section 4.1 to 4.3**.

4.1. Alliance Geotechnical (2018a)

Alliance Geotechnical Pty Ltd (AG) was engaged by Woods Bagot in 2017, to conduct a Stage 1 – Preliminary Site Investigation (PSI) for a portion of the Meadowbank Education and Employment Precinct Schools Project site at 2 Rhodes Street, Meadowbank, NSW (the site).

For this investigation, AG had the following project appreciation:

- TAFE and NSW Department of Education are in negotiations for the sale/purchase of the site;
- the site is being considered for redevelopment, comprising a primary school and secondary school; and
- contamination assessment works are required to inform the property transaction process and master planning process.

The objectives of this investigation were to:

- assess the potential for contamination to be present on the site as a result of past and current land use activities;
- provide advice on whether the site would be suitable (in the context of land contamination) for a primary school and secondary school land use setting; and
- provide recommendations for further investigation, management and/or remediation (if warranted).

The scope of works undertaken to address the investigation objectives, included:

- a desktop review;
- a site walkover; and
- data assessment and reporting.

Alliance Geotechnical (2018a) reported that the predominant historical land title holdings for the site included the Metropolitan Water Sewerage and Drainage Board, and the Meadowbank Manufacturing Company.

The site history data collected and site walkover observations made were assessed within the objectives of the investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be present onsite.

Based on AG's assessment of the desktop review and site walkover data, in the context of the proposed development scenario, AG concluded that:

- there is a moderate potential for land contamination to be present on the site, as a result of past and current land use activities; and
- further investigation would be required to make an assessment of the suitability of the site, for a primary school and secondary school land use setting.

Based on these conclusions, AG made the following recommendations:

- A Stage 2 – Detailed Site Investigation (DSI) should be undertaken for the site. AG notes that, if a Stage 2 – DSI is undertaken while the site remains operational and/or while existing buildings and infrastructure remain on the site, there will likely be constraints limiting further assessment of some areas of the site, which may increase uncertainty around the contamination status of the site; and
- The Stage 2 – DSI should be undertaken by a suitably experienced environmental consultant.

4.2. Alliance Geotechnical (2018b)

Alliance Geotechnical Pty Ltd (AG) was engaged by Woods Bagot (the client), to conduct a Stage 2 – Detailed Site Investigation (DSI) for a portion of the Meadowbank Education and Employment Precinct Schools Project site at 2 Rhodes Street, Meadowbank, NSW (the site).

For this investigation, AG had the following project appreciation:

- TAFE and NSW Department of Education are in negotiations for the sale/purchase of the site;
- The site is being considered for redevelopment, comprising a primary school and secondary school; and
- contamination assessment works are required to inform the property transaction process and master planning process.

The objectives of this investigation were to:

- assess the nature and likely extent of identified contaminants of potential concern (COPC) in the identified areas of environmental concern;
- provide advice on whether the identified COPC present an unacceptable human health exposure risk (in the context of land contamination) for the proposed land use setting; and
- provide recommendations for further investigation, management and/or remediation (if warranted).

The scope of works undertaken to address the investigation objectives, included:

- a desktop review;
- intrusive drilling and soil sampling fieldwork;
- laboratory analysis; and

- data assessment and reporting.

The site history data collected and site walkover observations made were assessed within the objectives of this investigation and in the context of the proposed development works. That assessment identified areas of environmental concern (AEC) and contaminants of potential concern (COPC) which have the potential to be present on site. The identified AEC and associated COPC are presented in **Table 4.2**.

Table 4.2 AEC and COPC

ID	AEC	Land Use Activity	Contaminants of Potential Concern
AEC01	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC02	Block Y1	Boat building and chemical storage / handling	Hydrocarbons and metals
AEC03	Block Y6	Boat building and chemical storage / handling	Hydrocarbons and metals
AEC04	Former dwelling	Uncontrolled demolition	Metals and asbestos
AEC05	Former dwelling	Uncontrolled demolition	Metals and asbestos
AEC06	Open space	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC07	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC08	Former building	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC09	Former dwelling	Uncontrolled demolition	Metals and asbestos
AEC10	Former greenhouse	Pesticide storage / handling	Pesticides and metals
AEC11	Multipurpose courts	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos

ID	AEC	Land Use Activity	Contaminants of Potential Concern
AEC12	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC13	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC14	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos.
AEC15	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC16	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC17	Carpark and grassed area	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC18	Small embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC19	Embankment next to path	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
-	General site footprint	Potential uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos

Soil sampling was undertaken by AG on 13 and 14 January 2018. A total of 44 sampling points (BH01 to BH41 and SS01 to SS03) were established on site. Sampling points BH01 to BH41 were excavated using a track mounted drilling rig fitted with push tube and solid flight augers, or a hand auger where access was limited. Soil samples at SS01 to SS03 were collected as grab samples from the surface.

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG made the following conclusions:

- the concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable direct contact human health exposure risk, with the exception of:

- lead in soil at BH02 (560mg/kg), lead in soil at BH22 (490mg/kg) and lead in soil at BH24 (610mg/kg);
 - benzo(a)pyrene (TEQ) in soil at BH04 (8.5mg/kg), BH16 (18mg/kg), and BH23 (8.4mg/kg); and
 - asbestos in soils in the vicinity of sampling points BH07, SS02, SS03, BH30, BH40 and BH41;
- the concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable inhalation / vapour intrusion human health exposure risk;
- the concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present a petroleum hydrocarbon management limit risk;
- the asbestos detected in the soils assessed, may present an unacceptable human health exposure risk and unacceptable aesthetics risk;
- the site could be made suitable for the proposed land use setting, subject to the further assessment, management and/or remediation of potential unacceptable contamination risks and those areas unable to be assessed.

Based on these conclusions, AG made the following recommendations:

- a Supplementary Contamination Assessment should be undertaken by a suitably experienced environmental consultant to:
 - further characterise the nature and extent of the elevated concentrations of lead in soil risks and benzo(a)pyrene (TEQ) in soil risks;
 - further characterise the nature and extent of asbestos in soil risks, and provide a quantitative assessment of those risks;
 - address data gaps associated with AEC13, the southern portion of AEC10, and the central portions of AEC02, AEC03, AEC09, AEC12, AEC14, AEC15, AEC16 (constrained due to the presence of existing structures and/or accessibility constraints);
- consideration should be given to removal of existing structure and accessibility constraints, prior to undertaking the supplementary contamination assessment. Removal of access constraints would likely also require provision for significant surface and pavement disturbance across the site to facilitate quantitative asbestos in soil risk assessment;
- pending the findings of the supplementary contamination assessment, a remedial action plan should be prepared to address unacceptable soil contamination related human health exposure risks. The RAP should be prepared by a suitably experienced consultant with reference to NSW OEH (2011) and include (but not be limited to) the following:
 - a remedial goal for the site;
 - an assessment of remedial options available to address the identified asbestos risks. These options may include removal offsite, in-situ containment, ex-situ containment, or a combination of these:
 - Offsite removal would likely involve excavation and disposal of impacted materials. Subject to successful removal of all impacted material, it is unlikely that a long term operational environmental management plan (EMP) would be required for the proposed development site;
 - In-situ containment could include application of a capping layer across the site. Typically, concrete and/or asphalt pavements are adequate for non-exposed soils, while a minimum 0.5m thickness of clean fill (excluding planting media) would be

required in unsealed areas (e.g. playgrounds, soft landscaping etc). Depending on design levels for the development, a portion of the impacted soils may require removal offsite to allow for capping layer thicknesses. This remedial strategy would likely require a long-term environmental management plan (EMP) for the proposed development site, and notification on the Section 10.7 (formally Section 149) planning certificate and/or title for the site;

- Ex-situ containment could include excavation and relocation of a portion of the impacted material elsewhere on the site, and application of a capping layer (similar to that discussed for in-situ containment). This remedial strategy would likely require a long term operational environmental management plan (EMP) for the proposed development site, and notification on the Section 10.7 (formally Section 149) planning certificate and/or title for the site;
 - the proposed testing to validate the site after remediation;
 - the proposed testing to validate the site after remediation;
 - a contingency plan to address unexpected finds or if the selected remedial strategy fails; and
 - a site management plan (for the remediation works).

4.3. Alliance Geotechnical (2018c)

Alliance Geotechnical Pty Ltd (AG) was engaged by Woods Bagot, to prepare a Remedial Action Plan (RAP) for the site.

AG had the following project appreciation:

- The site is being considered for redevelopment, comprising a primary school and secondary school;
- A Stage 1 Preliminary Site Investigation (PSI) and Stage 2 Detailed Site Investigation (DSI) of the site were reported by AG in February 2018;
- The Stage 2 DSI were considered adequate in providing a reasonable characterisation of land contamination at the site, in those areas that were accessible at the time the Stage 2 DSI works were undertaken;
- It is not considered reasonable (nor would it be considered to be industry accepted practice) to assume that the condition of the land in areas that were inaccessible, would be the same as the land nearby which may have been investigated as part of the Stage 2 DSI;
- It is considered impractical to assess the condition of the land in those inaccessible areas, prior to demolition and removal of access constraints on site (including buildings and hardstand materials), as those constraints would prevent implementation of industry accepted investigation techniques required to address relevant data gaps identified in the Stage 2 DSI;
- A Remedial Action Plan (RAP) is required to provide a strategy for addressing contamination already identified at the site, as well as a strategy for addressing contamination related data gaps identified in the Stage 2 DSI. AG considers this is an industry accepted approach to managing sites where further contamination assessment works may be constrained by site accessibility, and that development consent for a site would incorporate a condition requiring implementation of all strategies in the RAP (including any supplementary contamination assessment works necessary);
- The RAP is required to include remedial strategies for contamination identified to date (by way of the previously reported Stage 2 DSI), and remedial strategies for unexpected finds

(which may be identified by supplementary contamination assessment works and/or during planned remedial works);

- A supplementary RAP would not be needed following supplementary contamination assessment works. Rather, an addendum to the existing RAP would be produced (if needed), to further refine the extent of remedial works required in those areas already nominated for remedial works, as well as confirm the extent of remedial works (if any) in areas which might be identified during supplementary contamination assessment works; and
- The RAP should address the need for, and structure of, an addendum to the RAP.

The objectives of this project were to prepare a remedial action plan to address:

- Investigation of areas of environmental concern identified in the previous AG contamination assessments, that have not yet been investigated;
- Supplementary investigation of those areas of environmental concern identified in the previous AG contamination assessments, where additional investigation is required to characterise those AEC; and
- Management and/or remediation of already identified unacceptable land contamination risks.

AG notes that, subsequent to the findings of the supplementary contamination assessment works being undertaken, an addendum to this RAP may be required to address newly identified unacceptable land contamination risks.

AG undertook the following scope of works to address the project objectives:

- A desktop review; and
- Reporting.

The site history data collected was assessed within the objectives of this project and in the context of the proposed development works. That assessment identified the following areas of environmental concern (AEC) and contaminants of potential concern (COPC) which either require assessment, further assessment, and/or remediation. The AEC identified and associated COPC are presented in the table below.

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Previous sampling point BH02	Uncontrolled filling	Lead
AEC02 (central portion)	Block Y1	Boat building and chemical storage / handling	Hydrocarbons and metals
AEC02	Previous sampling point BH04	Boat building and chemical storage / handling	Benzo(a)pyrene (TEQ)
AEC03 (central portion)	Block Y6	Boat building and chemical storage / handling	Hydrocarbons and metals

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC05	Previous sampling point BH07	Uncontrolled demolition	Asbestos
AEC09 (central portion)	Former dwelling	Uncontrolled demolition	Metals and asbestos
AEC10 (southern portion)	Former greenhouse	Pesticide storage / handling	Pesticides and metals
AEC11	Previous sampling point BH16	Manufacturing and demolition	Benzo(a)pyrene (TEQ)
AEC12 (central portion)	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC13	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC14 (central portion)	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos.
AEC14 (BH22)	Previous sampling point BH22	Manufacturing and demolition	Lead
AEC15 (central portion)	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC15	Previous sampling point BH23	Manufacturing and demolition	Benzo(a)pyrene (TEQ)
AEC15	Previous sampling point BH24	Manufacturing and demolition	Lead
AEC16 (central portion)	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC18	Previous sampling point SS03	Uncontrolled filling	Asbestos
AEC19	Previous sampling point BH30	Uncontrolled filling	Asbestos

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
-	Previous sampling point SS02	Potential uncontrolled filling	Asbestos
-	Previous sampling point BH40	Potential uncontrolled filling	Asbestos
-	Previous sampling point BH41	Potential uncontrolled filling	Asbestos

The remedial goal for this site is to remediate potential soil contamination (where identified) to a level that does not present an unacceptable human health exposure risk, based on the proposed land use setting. AG notes that the client would prefer that the remedial works be undertaken in a manner that does not result in the need for:

- Notation on a planning certificate for the site;
- A covenant registered on the title to the land; or
- A long-term environmental management plan (EMP).

The lateral extent of remediation on the site is considered to be, as a minimum, the following:

- lead impacted soils in the vicinity of BH02;
- benzo(a)pyrene TEQ impacted soils in the vicinity of BH04;
- asbestos impacted soils in the vicinity of BH07;
- benzo(a)pyrene TEQ impacted soils in the vicinity of BH16;
- lead impacted soils in the vicinity of BH22;
- benzo(a)pyrene TEQ impacted soils in the vicinity of BH23;
- lead impacted soils in the vicinity of BH24;
- asbestos impacted soils in the vicinity of SS03;
- asbestos impacted soils in the vicinity of SS02;
- asbestos impacted soils in the vicinity of BH40; and
- asbestos impacted soils in the vicinity of BH41.

It is noted that the extent of remediation may be altered, pending the outcomes of the supplementary contamination assessment works, still needing to be undertaken on the site. The nature and extent of supplementary assessment works is set out in this RAP.

Based on the extent of the remediation identified, and the proposed site redevelopment works, remedial options considered appropriate for this site include:

- In-situ containment by capping;
- Ex-situ containment by capping;
- Excavation and removal off site.

Taking into consideration the client's objectives for the site, and the nature and extent of the proposed site redevelopment works, the preferred remedial option for the site is:

- excavation and offsite disposal.

Based on the information presented in the historical contamination assessment reports, AG made the following conclusions:

- Implementation of the strategies, methodologies and measures set out in this remedial action plan would:
 - provide information to address previously identified data gaps for the site;
 - facilitate further characterisation of previously identified potentially unacceptable land contamination risks;
 - facilitate management and/or remediation of potentially unacceptable land contamination risks;
- should newly identified unacceptable land contamination risks be identified during supplementary assessment works, an addendum to this RAP may be required. The addendum should be prepared by a suitably experienced environmental consultant;
- Prior to any removal of soils from site for offsite disposal during remedial works, a waste classification for those soils should be prepared by a suitably experienced environmental consultant;
- Future remedial works should be monitored and validated by a suitably experienced environmental consultant.

5. CONCEPTUAL SITE MODEL

The site history data collected was assessed within the objectives of this project and in the context of the proposed development works. That assessment identified the following areas of environmental concern (AEC) and contaminants of potential concern (COPC) which either require assessment, further assessment, and/or remediation. The AECs identified are presented in attached **Figure 3** and associated COPC are presented in **Table 5.1**.

Table 5.1: AEC and COPC

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC01	Previous sampling point BH02	Uncontrolled filling	Lead
AEC02 (central portion)	Block Y1	Boat building and chemical storage / handling	Hydrocarbons and metals
AEC02	Previous sampling point BH04	Boat building and chemical storage / handling	Benzo(a)pyrene (TEQ)
AEC03 (central portion)	Block Y6	Boat building and chemical storage / handling	Hydrocarbons and metals
AEC05	Previous sampling point BH07	Uncontrolled demolition	Asbestos
AEC09 (central portion)	Former dwelling	Uncontrolled demolition	Metals and asbestos
AEC10 (southern portion)	Former greenhouse	Pesticide storage / handling	Pesticides and metals
AEC11	Previous sampling point BH16	Manufacturing and demolition	Benzo(a)pyrene (TEQ)
AEC12 (central portion)	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC13	Embankment	Uncontrolled filling	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos

ID	Area of Environmental Concern	Land Use Activity	Contaminants of Potential Concern
AEC14 (central portion)	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos.
AEC14 (BH22)	Previous sampling point BH22	Manufacturing and demolition	Lead
AEC15 (central portion)	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC15	Previous sampling point BH23	Manufacturing and demolition	Benzo(a)pyrene (TEQ)
AEC15	Previous sampling point BH24	Manufacturing and demolition	Lead
AEC16 (central portion)	Former industrial building	Manufacturing and demolition	Hydrocarbons, pesticides, polychlorinated biphenyl, metals, asbestos
AEC18	Previous sampling point SS03	Uncontrolled filling	Asbestos
AEC19	Previous sampling point BH30	Uncontrolled filling	Asbestos
-	Previous sampling point SS02	Potential uncontrolled filling	Asbestos
-	Previous sampling point BH40	Potential uncontrolled filling	Asbestos
-	Previous sampling point BH41	Potential uncontrolled filling	Asbestos

5.1. Land Use Setting

AG understands that the proposed development works includes the demolition of historical site structures and construction of a combined primary-high school and associated infrastructure.

Based on the proposed development works and guidance provided in Section 2.2 of NEPC (1999a), AG considers it reasonable to adopt the 'HIL A – residential with accessible soils' land use setting, for the purpose of assessing land contamination exposure risks.

5.2. Direct Contact – Human Health

Portions of the site will be covered with building footprints and hardstand areas; however, some exposed soil areas will likely remain, in the form of playground areas, sporting fields, and general softscape. It is considered that a complete direct contact exposure pathway for may exist in these areas.

5.3. Inhalation / Vapour Intrusion – Human Health

In order for a potentially unacceptable inhalation / vapour intrusion human health exposure risk to exist, a primary vapour source (e.g. underground storage tank) or secondary vapour source (e.g. significantly contaminated soil or groundwater) is required.

The historical evidence reviewed did not indicate a potential for a primary source to be present on the site.

The same historical evidence indicated a potential land use activity to be uncontrolled filling. The excavation, transport, placement and spreading of imported (uncontrolled) fill material involves significant disturbance of soils which typically results in volatilisation of vapour producing contaminants.

A groundwater source of vapours was not identified for the site.

The potential for vapours to be present in soils on site at concentrations which might present an unacceptable exposure risk, is considered to be low to negligible, however, further assessment is considered warranted, given the sensitive nature of the proposed land use setting.

5.4. Management Limits for Petroleum Hydrocarbon Compounds

NEPC (1999a) notes that there are a number of policy considerations which reflect the nature and properties of petroleum hydrocarbons:

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

NEPC (1999a) includes ‘management limits’ to avoid or minimise these potential effects. Application of the management limits requires consideration of site-specific factors such as the depth of building basements and services and depth to groundwater, to determine the maximum depth to which the limits should apply. NEPC (1999a) also notes that management limits may have less relevance at operating industrial sites which have no or limited sensitive receptors in the area of potential impact, and when management limits are exceeded, further site-specific assessment and management may enable any identified risk to be addressed.

Given the nature of the identified contaminants of potential concern at the site, further assessment against these management limits is considered warranted.

5.5. Aesthetics – Human Health

Section 3.6.3 of NEPC (1999a) advises that there are no specific numeric aesthetic guidelines, however site assessment requires a balanced consideration of the quantity, type and distribution of foreign material or odours in relation to the specific land use and its sensitivity.

Portions of the site will be covered with building footprints and hardstand areas, however, some exposed soil areas will likely remain, in the form of playground areas, sporting fields, and general softscape. It is considered that a complete aesthetics exposure pathway for may exist in these areas.

5.6. Terrestrial Ecosystems

NEPC (1999) requires a pragmatic risk-based approach should be taken in applying ecological investigation and screening levels in residential and commercial / industrial land use settings.

It is noted that vegetation on site and on adjacent properties did not display evidence of significant or widespread phytotoxic impact (i.e. plant stress or dieback).

Further assessment of unacceptable risk to terrestrial ecosystems is considered not warranted.

6. DATA QUALITY OBJECTIVES

Appendix B of NEPC (1999b) provides guidance on the development of data quality objectives (DQO) using a seven-step process.

The DQO for this project are set out in **Sections 6.1 to 6.7** of this report.

6.1. Step 1: State the problem

The first step involves summarising the contamination problem that will require new data and identifying the resources available to resolve the problem.

The key objectives of this project are to assess the data gaps and delineate the identified contamination presented in (AG, 2018b & AG, 2018c) and provide recommendations for further investigation, management and/or remediation (if warranted) in accordance with the proposed land use setting.

This project is being undertaken because:

- the site is the subject of redevelopment works; and
- historically identified areas of environmental concern on the site, have the potential to present an unacceptable human health exposure risk in the context of the proposed land use setting.

The project team identified for this project includes Alliance Geotechnical Pty Ltd, the developer and the planning consent authority.

The regulatory authorities identified for this investigation include NSW EPA and the local Council.

6.2. Step 2: Identify the decision/goal of the study

The second step involves identifying decisions that need to be made about the contamination problem and the new environmental data required to make them.

The decisions that need to be made during this investigation include:

- Is the environmental data collected for the project, suitable for assessing relevant land contamination exposure risks?
- Have the data gaps presented in (AG, 2018b) been addressed;
- Has the contamination identified in (AG2018b & AG, 2018c) been delineated;
- Do the concentrations of identified contaminants of potential concern (COPC) present an unacceptable exposure risk to identified receptors, for the proposed land use setting?
- Is the site suitable or can the site be deemed suitable for the proposed land use setting, in the context of land contamination?

6.3. Step 3: Identify the information inputs

The third step involves identifying the information needed to support decisions and whether new environmental data will be needed.

The inputs required to make the decisions set out in **Section 6.2** for this investigation, will include:

- data obtained during searches of the site's history;
- the nature and extent of sampling at the site, including both density and distribution;
- samples of relevant site media;
- the NATA accredited analysis of physical and/or chemical parameters of the relevant site media samples; and
- assessment criteria adopted for each of the media sampled.

Taking into consideration the objectives of this project, and the conceptual site model and land use setting presented in **Section** Error! Reference source not found. of this project, the assessment criteria relevant to the proposed land use setting have been adopted for this investigation:

- Human health direct contact – HILs in Table 1A (1) in NEPC (1999a) and HSLs in Table B4 of Friebel, E & Nadebaum, P (2011);
- Human health inhalation/vapour intrusion – HSLs in Table 1 (A) in NEPC (1999a);
- Human health (asbestos) – HSLs in Table 7 of NEPC (1999a);
- Petroleum hydrocarbon compounds (management limits) – Table 1 B(7) of NEPC (1999a); and
- Aesthetics – no highly malodorous site media (e.g. strong residual petroleum hydrocarbon odours, hydrogen sulphide in site media, organosulfur compounds), no hydrocarbon sheen on surface water, no discoloured chemical deposits or soil staining with chemical waste other than of a very minor nature, no large monolithic deposits of otherwise low risk material (e.g. gypsum as powder or plasterboard, cement kiln dust), no presence of putrescible refuse including material that may generate hazardous levels of methane such as a deep-fill profile of green waste or large quantities of timber waste, and no soils containing residue from animal burial (e.g. former abattoir sites).

6.4. Step 4: Define the boundaries of the study

The fourth step involves specifying the spatial and temporal aspects of the environmental media that the data must represent to support decisions.

The spatial extent of the project will be limited to the site as defined by its boundaries.

The temporal boundaries of the project include:

- the project timeframes presented in the AG proposal for this project, and subsequent remediation contractor works program;
- unacceptable weather conditions at the time of undertaking fieldwork, including rainfall, cold and/or heat;
- access availability of the site (to be defined by the site owner/representative); and
- availability of AG field staff (typically normal daylight working hours, Monday to Friday).

The lateral extent that contamination is expected to be distributed across, based on the conceptual site model, is defined by the inferred boundaries of the areas of environmental concern (AEC).

The vertical extent that contamination is expected to be distributed across, based on the conceptual site model and the project scope, is limited to base of fill material.

The scale of the decisions required will be based on the entire site.

Constraints which may affect the carrying out of this investigation may include access limitations, presence of above and below ground infrastructure, and hazards creating health and safety risks.

6.5. Step 5: Develop the analytical approach (or decision rule)

The fifth step involves defining the parameter of interest, specifying the action level, and integrating information from Steps 1 to 4 into a single statement that gives a logical basis for choosing between alternative actions.

6.5.1. Rinsate Blanks

One rinsate blank will be collected and scheduled for analysis, for each day of sampling undertaken, if non-disposable sampling equipment was used on that day. The rinsate blank will be analysed for at least one of the analytes the sample/s collected that day are being scheduled for analysis for (with the exception of asbestos).

6.5.2. Trip Spikes and Trip Blank Samples

One trip spike and trip blank sample will be used and scheduled for analysis, for each day of sampling undertaken, if site samples being collected that day are being analysed for volatile contaminants of concern (typically BTEX and/or TRH C₆-C₁₀).

6.5.3. Field Duplicates and Field Triplicates

Field duplicate and Field triplicates will be collected at a rate of one per twenty (5%) site samples collected. The duplicates and triplicates collected will be analysed for at least one of the analytes that the parent sample of the duplicate/triplicate is being scheduled for analysis for (with the exception of asbestos).

The relevant percent difference (RPD) of concentrations of relevant analytes, between the parent sample and the duplicate/triplicate will be calculated.

6.5.4. Laboratory Analysis Quality Assurance / Quality Control

The analytical laboratory QA/QC program will typically include laboratory method blank samples, matrix spike samples, surrogate spike samples, laboratory control samples, and laboratory duplicate samples.

6.5.5. If/Then Decision Rules

AG has adopted the following 'if/then' decision rules for this investigation:

- If the result of the assessment of field data and laboratory analytical data is considered acceptable, then that field data and laboratory analytical data is suitable for interpretation within the scope of this investigation; and
- If the field data and laboratory analytical data is within the constraints of the assessment criteria adopted for this investigation (refer **Section 6.3**), then the contamination exposure risks to identified receptors, are considered acceptable.

In the event the assessment of field data and/or laboratory analytical data results in the data being not suitable for interpretation, then AG will determine if additional data is required to allow interpretation to be undertaken.

In the event that field data and/or laboratory analytical data exceeds the assessment criteria adopted for this investigation (refer **Section 6.3**), AG will undertake an assessment of the exceedance in the

context of the project objectives to determine if additional data is required and whether management and/or remediation is required.

6.6. Step 6: Specify the performance or acceptance criteria

The sixth step involves specifying the decision maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. When assessing contaminated land, there are generally two types of errors in decision making:

- Contamination exposure risks for a specific land use setting are acceptable, when they are not; and
- Contamination exposure risks for a specific land use setting are not acceptable, when they are.

AG will mitigate the risk of decision error by:

- Calculation of the 95% upper confidence limit (UCL) statistic to assess the mean concentration of relevant contaminants of potential concern;
- Assignment of fieldwork tasks to suitably experienced AG consulting staff, and suitably experienced contractors;
- Assignment of laboratory analytical tasks to reputable NATA accredited laboratories;
- Assignment of data interpretation tasks to suitably experienced AG consulting staff, and outsourcing to technical experts where required.

AG will also adopt a range of data quality indicators (DQI) to facilitate assessment of the completeness, comparability, representativeness, precision and accuracy (bias).

Completeness			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion
Critical locations sampled	Refer Section 6.7	Critical samples analysed according to DQO	Refer Section 6.7
Critical samples collected	Refer Section 6.7	Analytes analysed according to DQO	Refer Section 6.7
SOPs appropriate and complied with	100%	Appropriate laboratory analytical methods and LORs	Refer Section 6.7
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	Sample documentation complete	All sample receipt advices, all certificates of analysis
		Sample extraction and holding times complied with	Refer Section 6.7
Comparability			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion

Same SOPs used on each occasion	100%	Same analytical methods used by primary laboratory	Refer Section 6.7
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	Same LORs at primary laboratory	Refer Section 6.7
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	Same laboratory for primary sample analysis	All primary samples to SGS Environmental
		Same analytical measurement units	Refer Section 6.7
Representativeness			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion
Appropriate media sampled according to SAQP	Refer Section 6.4	Samples analysed according to SAQP	Refer Section 6.7
Media identified in SAQP sampled	Refer Section 6.4		
Precision			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion
Field duplicate / triplicate RPD	<p>Minimum 5% duplicates and triplicates</p> <p>No limit for analytical results <10 times LOR</p> <p>50% for analytical results 10-20 times LOR</p> <p>30% for analytical results >20 times LOR</p>	Laboratory duplicates	No exceedances of laboratory acceptance criteria
SOPs appropriate and complied with	100%		
Accuracy (bias)			
Field Considerations	Assessment Criterion	Laboratory Considerations	Assessment Criterion
Rinsate blanks	Less than laboratory limit of reporting	Laboratory method blank	No exceedances of laboratory acceptance criteria

Field trip spikes	Recoveries between 60% and 140%	Matrix spike recovery	No exceedances of laboratory acceptance criteria
Field trip blanks	Analyte concentration <LOR	Surrogate spike recovery	No exceedances of laboratory acceptance criteria
		Laboratory control sample recovery	No exceedances of laboratory acceptance criteria

6.7. Step 7: Develop the plan for obtaining data

The seventh step involves identifying the most resource effective sampling and analysis design for generating the data that is required to satisfy the DQOs.

6.7.1. Sampling Point Layout Plan

Table A in NSW EPA (1995) provides guidance on minimum sampling point densities required for site characterisation, based on detecting circular hot spots by using a systematic sampling pattern. This guidance assumes the investigator has little knowledge about the probable locations of the contamination, the distribution of the contamination is expected to be random (e.g. land fill sites) or the distribution of the contamination is expected to be fairly homogenous (e.g. agricultural lands).

However, Section 3.1 of NSW EPA (1995) states that a judgemental sampling pattern can be used where there is enough information on the probable locations of contamination. Further to this, Section 6.2.1 of NEPC (1999b) states that the number and location of sampling points is based on knowledge of the site and professional judgement. Sampling should be localised to known or potentially contaminated areas identified from knowledge of the site either from site history or an earlier phase of site investigation. Judgemental sampling can be used to investigate sub-surface contamination issues in site assessment.

As this investigation has included gathering data which provides a reasonable understanding of site history (in the context of potential areas of environmental concern on the site) and taking into consideration Table 1 in WA DOH (2009), it is considered reasonable to adopt a judgemental sampling pattern, where necessary, for each AEC.

The proposed sampling point layout arrangement for this project is presented in **Table 6.7.1**. The locations of the proposed sampling points are set out in **Figure 4**.

Table 6.7.1 Validation Sampling

Area of Environmental Concern	Sampling Point ID	Validation Sampling
AEC01	BH02A-BH02D	Four step-out soil bores around sampling point BH02 to a target depth of 0.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC02 (central portion)	TP42-TP43	Two test-pits to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.

Area of Environmental Concern	Sampling Point ID	Validation Sampling
AEC02	TP04A-TP04D	Four step out test-pits to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC03 (central portion)	TP44	One test-pit to a target depth of 1.7m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC05	TP07A – TP07D	Four step out test-pits to a target depth of 0.6m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC09 (central portion)	TP45	One test-pit to a target depth of 0.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC10 (southern portion)	TP46	One test-pit to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC11	TP16A – TP16D	Four step out test-pits to a target depth of 2.0m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC12 (central portion)	TP47	One test-pit to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC13	TP49 – TP54	Six test-pits to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC14 (central portion)	TP55	One test-pit to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC14	TP22A-TP22D	Four step out test-pits to a target depth of 1.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC15 (central portion)	TP56	One test-pit to a target depth of 0.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC15	TP23A-TP23D	Four step out test-pits to a target depth of 0.5m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.

Area of Environmental Concern	Sampling Point ID	Validation Sampling
AEC15	TP24A-TP24D	Four step out test-pits to a target depth of 0.6m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC16 (central portion)	TP57	One test-pit to a target depth of 1.0, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC18	SS03A-SS03C	Four step out test-pits to a target depth of 1.0m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
AEC19	TP30A-TP30D	Three test-pits to a target depth of 2.0m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
-	SS02A-SS02D	Four step out test-pits to a target depth of 1.0m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
-	BH40A-BH40D	Four step out test-pits to a target depth of 2.0m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.
-	BH41A-BH41D	Four step out test-pits to a target depth of 2.0m, or 0.3m into inferred natural material, or practical refusal, whichever occurs first.

If visual or olfactory observations indicated a potential for soil contamination to be present, then collection of additional samples will be considered.

The location of each sampling point will be marked on a site plan.

6.7.2. Identification, Storage and Handling of Samples

Sample identifiers will be used for each sample collected, based on the sampling point number and the depth/interval the sample was collected from, e.g. a sample collected from test pit TP03 at a depth of 0.2m to 0.4m below ground level, would be identified as TP03/0.2-0.4.

Project samples will be stored in laboratory prepared glass jars (chemical) and zip lock bags (asbestos).

Soil samples in glass jars will be placed in insulated container/s with ice.

Samples will be transported to the relevant analytical laboratory, with chain of custody (COC) documentation that includes the following information:

AG project identification number

- Each sample identifier
- Date each sample was collected
- Sample type (e.g. soil or water)

- Container type/s for each sample collected
- Preservation method used for each sample (e.g. ice)
- Analytical requirements for each sample and turnaround times
- Date and time of dispatch and receipt of samples (including signatures)

6.7.3. Headspace Screening

Where the contaminants of potential concern include volatiles (e.g. TRH, BTEX), project soil samples will be subjected to field screening for ionisable volatile organic compounds (VOC), using a photo-ionisation detector (PID). The results of field screening will be recorded on sampling point log.

6.7.4. Decontamination

In the event that non-disposable sampling equipment is used, that equipment will be decontaminated before and in between sampling events, to mitigate potential for cross contamination between samples collected. The decontamination methodology to be adopted for this project will include:

- Washing relevant sampling equipment using potable water with a phosphate free detergent (i.e. Decon 90 or similar) mixed into the water;
- Rinsing the washed non-disposable sampling equipment with distilled or de-ionised water; and
- Air drying as required.

6.7.5. Laboratory Selection

The analytical laboratories used for this project will be NATA accredited for the analysis undertaken.

6.7.6. Laboratory Analytical Schedule

Project samples will be scheduled for NATA accredited laboratory analysis, using a combination of:

- Observations made in the field of the media sampled;
- Headspace screening results (where available);
- The contaminants of potential concern (COPC) identified for the area of environmental concern that the sample was collected from.

Based on site history and completed contamination assessments (AG, 2018b), AG has adopted the laboratory analytical schedule presented in **Table 6.7.6** for this project.

Table 6.7.6 Laboratory Analytical Schedule

AEC	Sampling Point ID	Analytical Schedule
AEC01	BH02A-BH02D	8 x lead
AEC02 (central portion)	TP42-TP43	4 x TRH, BTEX and metals (8)
AEC02	TP04A-TP04D	8 x PAH
AEC03 (central portion)	TP44	2 x TRH, BTEX and metals (8)
AEC05	TP07A – TP07D	4 x asbestos (ACM and 0.001%)
AEC09 (central portion)	TP45	1 x Metals (8) and Asbestos (ACM and 0.001%)

AEC	Sampling Point ID	Analytical Schedule
AEC10 (southern portion)	TP46	2 x OCP and metals (8)
AEC11	TP16A – TP16D	8 x PAH
AEC12 (central portion)	TP47	1 x TRH, BTEX, PAH, OCP, PCB, metals (8) and asbestos (ACM and 0.001%)
AEC13	TP49 – TP54	6 x TRH, BTEX, PAH, OCP, PCB, metals (8) and asbestos (ACM and 0.001%)
AEC14 (central portion)	TP55	1 x TRH, BTEX, PAH, OCP, PCB, metals (8) and asbestos (ACM and 0.001%)
AEC14	TP22A-TP22D	8 x lead
AEC15 (central portion)	TP56	1 x TRH, BTEX, PAH, OCP, PCB, metals (8) and asbestos (ACM and 0.001%)
AEC15	TP23A-TP23D	8 x PAH
AEC15	TP24A-TP24D	8 x lead
AEC16 (central portion)	TP57	1 x TRH, BTEX, PAH, OCP, PCB, metals (8) and asbestos (ACM and 0.001%)
AEC18	SS03A-SS03C	3 x asbestos (ACM and 0.001%)
AEC19	TP30A-TP30D	6 x asbestos (ACM and 0.001%)
-	SS02A-SS02D	4 x asbestos (ACM and 0.001%)
-	BH40A-BH40D	8 x asbestos (ACM and 0.001%)
-	BH41A-BH41D	8 x asbestos (ACM and 0.001%)

6.7.7. Laboratory Holding Times, Analytical Methods and Limits of Reporting

The laboratory holding times, analytical methods and limits of reporting (LOR) being used for this project, are presented in **Table 6.7.7**.

Table 6.7.7 Laboratory Holding Times, Analytical Methods and Limits of Reporting

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
BTEX and TRH C ₆ -C ₁₀	14 days	USEPA 5030, 8260B and 8020	0.2-0.5
TRH >C ₁₀ -C ₄₀	14 days	USEPA 8015B & C	20-100

Analyte	Holding Time	Analytical Method	Limit of Reporting (mg/kg)
PAH	14 days	USEPA 8270	0.1-0.5
VOC	14 days	USEPA 8260	0.1-0.5
Metals	14 days	USEPA 8015B & C	0.05 – 2
Asbestos	No limit	AS4964:2004	Absence / presence
Asbestos	No limit	Inhouse Method	0.001% w/w

7. FIELDWORK

7.1. Soil Sampling

Soil sampling was undertaken by AG on 18, 19 and 20 June 2019.

A total of 61 sampling points were established onsite. Sampling points were established to address data gaps or to delineate contamination identified within previous contamination reports (AG, 2018b & AG, 2018c). Sampling points (BH02A to BH02D, BH40A to BH40B and BH41A to BH41D) were advanced using a utility mounted drill rig fitted with solid flight augers, or a hand-held mechanically operated push tube where access was limited. The remaining sampling points were excavated using an excavator and operator supplied by the client.

The locations of the sampling points established onsite are presented in **Figure 4**.

Image 7.1.1 View of sampling point BH40C



Samples were collected at each sampling point and placed in laboratory supplied acid-rinsed glass jars with Teflon lined lids (where required) and laboratory supplied 500ml zip-lock asbestos sample bags (where required). The jars and bags were labelled with the project number, sample identifier and date the samples were collected on.

Each sampling point was backfilled and track rolled at the completion of the sampling task.

Each sampling point established was marked on a site plan. The locations of these sampling points are presented in **Figure 4**.

7.2. Site Geology

Observations were made of soils encountered during sampling work. These observations were recorded on borehole logs. A copy of these logs is presented in **Appendix B**.

Anthropogenic materials observed in some of the fill material encountered included asphalt, metal, wood, glass, brick and potential ACM (in the form of fibrous cement sheeting fragments).

7.3. Headspace Screening

Samples collected were subjected to headspace screening. A sub sample from each sampling point was placed in a zip lock bag, sealed and shaken. Each bag was then pierced with the probe tip of a calibrated photoionisation detector (PID) and the screening results recorded. These results are recorded on the borehole logs presented in **Appendix B**.

The results of the headspace screening indicated the potential for ionisable volatile organic compounds (VOC) to be present in the samples, was generally low.

A copy of the calibration record for the PID is presented in **Appendix C**.

7.4. Odours

Olfactory evidence of odours in the soil samples collected, was not detected.

7.5. Staining

Visual evidence of staining in the soil samples collected, was not detected.

7.6. Potential Asbestos Containing Materials

Visual evidence of potential asbestos containing materials (ACM) was observed at several sampling points, including both on the surface and within the fill soil profile (TP04B, TP07A, TP30B, TP30C, TP40C and TP42). The evidence was in the form fibrous cement sheeting fragments. Samples of these fragments were collected when observed and submitted for analysis at a NATA accredited laboratory.

8. LABORATORY ANALYSIS

The samples collected were transported to the analytical laboratory, using chain of custody (COC) protocols. A selection of these samples was scheduled for analysis, with reference to the relevant COPC identified for the AEC that the samples were collected from.

A copy of the analytical laboratory certificates of analysis, is presented in **Appendix D**.

The sample analytical results were tabulated and presented in the attached **Table 1, Table 2 and Table 3**.

9. DATA QUALITY INDICATOR ASSESSMENT

9.1. Completeness

An assessment of the completeness of data collected was undertaken, and the results presented in **Table 9.1**.

Table 9.1 Completeness DQI

Field Considerations	Target	Actual	Comment
Critical locations sampled	61	61	Performance against indicator considered acceptable.
Critical samples collected	Refer Section 6.7	Refer Section 6.7	Performance against indicator considered acceptable.
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Field documentation complete	All sampling point logs, calibration logs and chain of custody forms	All sampling point logs, calibration logs and chain of custody forms	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Critical samples analysed according to DQO	Refer Section 6.7	Refer Section 6.7	Performance against indicator considered acceptable.
Analytes analysed according to DQO	Refer Section 6.7	Refer Section 6.7	Performance against indicator considered acceptable.
Appropriate laboratory analytical methods and LORs	Refer Section 6.7	Refer Section 6.7	Performance against indicator considered acceptable.
Sample documentation complete	All sample receipt advices, all certificates of analysis	100%	Performance against indicator considered acceptable.
Sample extraction and holding times complied with	Refer Section 6.7	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

9.2. Comparability

An assessment of the comparability of data collected was undertaken, and the results presented in **Table 9.2**.

Table 9.2 Comparability DQI

Field Considerations	Target	Actual	Comment
Same SOPs used on each occasion	100%	100%	Performance against indicator considered acceptable.
Climatic conditions	Samples stored in insulated containers with ice, immediately after collection	100%	Performance against indicator considered acceptable.
Same types of samples collected, and handled/preserved in same manner	All soil samples same size, all stored in insulated containers with ice	100%	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Same analytical methods used by primary laboratory	Refer Section 6.7	100%	Performance against indicator considered acceptable.
Same LORs at primary laboratory	Refer Section 6.7	100%	Performance against indicator considered acceptable.
Same laboratory for primary sample analysis	All primary samples to Eurofins MGT	100%	Performance against indicator considered acceptable.
Same analytical measurement units	Refer Section 6.7	100%	Performance against indicator considered acceptable.

The data collected is considered to be adequately comparable.

9.3. Representativeness

An assessment of the representativeness of data collected was undertaken, and the results presented in **Table 9.3**.

Table 9.3 Representativeness DQI

Field Considerations	Target	Actual	Comment
Appropriate media sampled according to DQO	Refer Section 6.7	100%	Performance against indicator considered acceptable.

Media identified in DQO sampled	Refer Section 6.7	100%	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Samples analysed according to DQO	Refer Section 6.7	Refer comments	Performance against indicator considered acceptable.

The data collected is considered to be adequately complete within the objectives and constraints of the project.

9.4. Precision

An assessment of the precision of data collected was undertaken, and the results presented in **Table 9.4**.

Table 9.4 Precision DQI

Field Considerations	Target	Actual	Comment
Field duplicate / triplicate RPD	Minimum 5% duplicates and triplicates	8.3 % duplicates and 8.3 % triplicates	Parent duplicate/triplicate relationships are as follows: DUP01/1A – TP054-0.0-0.2 DUP02/2A – TP30C-0.0-0.2 DUP03/3A – TP30A-0.0-0.2 DUP04/4A – TP057-0.0-0.2 DUP05/5A – TP23D-0.1-0.4
	No limit for analytical results <10 times LOR	Nil	Exceedances included:
	50% for analytical results 10-20 times LOR	Nil	<ul style="list-style-type: none"> zinc RPD for DUP01; and lead RPD for DUP1A.
	30% for analytical results >20 times LOR	Nil	<p>AG considers these exceedances are likely to be attributable to heterogeneity in each of the discrete soil samples, as the parent sample could not be homogenised prior to splitting, due to the potential for volatile and semi volatile contaminants to be present. As a conservative measure, the sample reporting the higher concentration of the relevant analyte should be used when making decisions regarding contamination risks on the site.</p> <p>Performance against indicator considered acceptable.</p> <p>Refer to Table 4</p>
SOPs appropriate and complied with	100%	100%	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Laboratory duplicates	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately precise.

9.5. Accuracy

An assessment of the precision of data collected was undertaken, and the results presented in **Table 9.5**.

Table 9.5 Accuracy DQI

Field Considerations	Target	Actual	Comment
Rinsate blanks	Less than laboratory limit of reporting	Not applicable	Not applicable
Field trip spikes	Recoveries between 60% and 140%	Recoveries were between 60% and 140%	Performance against indicator considered acceptable.
Field trip blanks	Analyte concentration <LOR	Analyte concentrations were <LOR	Performance against indicator considered acceptable.
Laboratory Considerations	Target	Actual	Comment
Laboratory method blank	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Matrix spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Surrogate spike recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.
Laboratory control sample recovery	No exceedances of laboratory acceptance criteria	No exceedances of laboratory acceptance criteria	Performance against indicator considered acceptable.

The data collected is considered to be adequately accurate.

10. DATA GAP ASSESSMENT (PREVIOUSLY INACCESSIBLE AREAS)

A discussion on comparison of laboratory analytical results and field observations carried out to assess the data gaps associated with (AG, 2018b), in the context of the assessment criteria adopted for this project, is presented in **Section 10.1** to **Section 10.3**. A summary of the laboratory analytical results for the data gap assessment completed at the site is presented in **Table 1** and sampling points are shown in **Figure 4**.

10.1. Human Health - Direct Contact

10.1.1. TRH

The concentrations of TRH C₆-C₁₀, >C₁₀-C₁₆, >C₁₆-C₃₄ and >C₃₄-C₄₀ detected in the soil samples analysed, were less than the laboratory limit of reporting and/or less than the applicable adopted direct contact human health exposure criteria.

10.1.2. BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the laboratory limit of reporting and less than the applicable adopted direct contact human health exposure criteria.

10.1.3. PAH

The concentrations of naphthalene detected in the soil samples analysed, were less than the laboratory limit of reporting and less than the applicable adopted direct contact human health exposure criteria.

The concentrations of benzo(a)pyrene TEQ detected in the soil samples analysed, were less than the laboratory limit of reporting and less than the applicable adopted direct contact human health exposure criteria.

The concentration of total PAH detected in the soil samples analysed, were less than the laboratory limit of reporting and/or less than the applicable adopted direct contact human health exposure criteria.

10.1.4. OCP

The concentration of relevant OCP compounds detected in the soil samples analysed, were less than the laboratory limit of reporting and/or less than the applicable adopted direct contact human health exposure criteria or less than laboratory limits of reporting.

10.1.5. PCB

The concentration of relevant PCB compounds detected in the soil samples analysed, were less than the laboratory limit of reporting and less than the applicable adopted direct contact human health exposure criteria.

10.1.6. Metals

The concentrations of arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury detected in the soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria.

10.1.7. Asbestos in Soil – Fibrous Asbestos (FA)/ Asbestos Fines (AF)

Fibrous asbestos and asbestos fines (FA and AF) were not detected in the relevant soil samples analysed, with the exception of asbestos concentrations at sampling points:

- **TP53-0.9-1.1:** (FA): chrysotile, amosite and crocidolite asbestos detected in weathered fibre cement fragments. No asbestos detected at the reporting limit of 0.001% w/w; and
- **TP57-0.0-0.2** (FA): chrysotile asbestos detected in weathered fibre cement fragments and (AF) chrysotile asbestos detected in the form of loose fibre bundles. Total estimated asbestos concentration in FA and AF was 0.0013% w/w.

10.2. Human Health – Inhalation / Vapour Intrusion (Residential)

10.2.1. TRH

The concentrations of TRH C₆-C₁₀ (minus BTEX) and >C₁₀-C₁₆ (minus naphthalene) detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

10.2.2. BTEX

The concentrations of benzene, toluene, ethyl benzene and xylenes detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

10.2.3. PAH

The concentrations of naphthalene detected in the soil samples analysed, were less than the applicable adopted inhalation / vapour intrusion human health exposure criteria.

10.3. TPH Management Limits (Residential)

The concentrations of TRH C₆-C₁₀, >C₁₀-C₁₆, >C₁₆-C₃₄ and >C₃₄-C₄₀ detected in the soil samples analysed, were less than the applicable adopted TRH management limits or less than laboratory limits of reporting.

11. CHEMICAL DELINEATION ASSESSMENT

A summary of the laboratory analytical results for the chemical delineation assessment completed at the site, is presented in **Table 2** and sampling points are shown in **Figures 5a** and **5b**.

11.1. Lead

The concentrations of lead detected in the delineation soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria, with the exception of:

- **TP22D-1.1-1.3:** 460mg/kg.

The detected concentrations of lead in the original soil samples collected at sampling point BH22 in addition to the delineation soil samples collected during this investigation, were subjected to a statistical analysis using ProUCL 5.1. The maximum value of the data set was 490 mg/kg, the standard deviation of the data set was 161.2, while the 95% upper confidence limit was 298.4, which is less than the adopted direct contact human health exposure criteria for lead (300mg/kg) at the site. A copy of the lead ProUCL output is presented in **Appendix E**.

11.2. Benzo(a)pyrene

The concentrations of benzo(a)pyrene detected in the delineation soil samples analysed, were less than the applicable adopted direct contact human health exposure criteria (refer to **Figures 5a** and **5b**).

12. ASBESTOS DELINEATION ASSESSMENT

A summary of the laboratory analytical results for the asbestos delineation assessment completed at the site is presented in **Table 3** and sampling points are shown in **Figures 6a** and **6b**.

12.1. Asbestos in Soil – Fibrous Asbestos (FA)/ Asbestos Fines (AF)

Fibrous asbestos and asbestos fines (FA and AF) were not detected in the relevant soil samples analysed, with the exception of asbestos concentrations at sampling points:

- **SS02D-0.0-0.3** (FA): chrysotile asbestos detected in the form of weathered fibre cement fragments. Total estimated asbestos concentration in FA asbestos was 0.0011% w/w;
- **TP30A-1.7-1.9** (AF): chrysotile and crocidolite asbestos detected in the form of loose fibre bundles. No asbestos detected at the reporting limit of 0.001% w/w; and
- **BH40D-0.9-1.1** (AF): chrysotile asbestos detected in the form of loose fibre bundles. No asbestos detected at the reporting limit of 0.001% w/w;

12.2. Non-friable Asbestos Containing Material (ACM)

Non-friable ACM was not detected in the delineation samples analysed, with the exception of:

- **TP04B**: chrysotile and amosite asbestos detected;
- **TP07A**: chrysotile asbestos detected;
- **TP30B**: chrysotile asbestos detected; and
- **TP30C**: chrysotile asbestos detected.

13. INDICATIVE WASTE CLASSIFICATION ASSESSMENT

Soil samples TP47_0.0-0.2, TP49_0.0-0.2, TP50_0.0-0.2, TP51_0.0-0.2, TP51_0.8-1.0, TP52_0.0-0.2, TP52_1.2-1.4, TP53_0.9-1.1, TP54_0.0-0.2, TP54_1.3-1.5, TP55-0.0-0.2, TP56-0.1-0.4 and TP57_0.0-0.2 collected during this investigation were compared to relevant contamination criteria outlined in the NSW EPA *Waste Classification Guidelines* (2014), to provide an indicative waste classification for the site.

The 6-step classification procedure in NSW EPA (2014) was followed, with the results presented in **Table 13.1**.

Table 13.1. NSW EPA *Waste Classification Guidelines* (2014) 6 Step Classification Procedure

Step	Material Observation
1 <i>Is the waste special waste?</i>	<p>Yes.</p> <p>TP53-0.9-1.1: (FA): chrysotile, amosite and crocidolite asbestos detected in weathered fibre cement fragments. No asbestos detected at the reporting limit of 0.001% w/w; and</p> <p>TP57-0.0-0.2 (FA): chrysotile asbestos detected in weathered fibre cement fragments and (AF) chrysotile asbestos detected in the form of loose fibre bundles. Total estimated asbestos concentration in FA and AF was 0.0013% w/w.</p>
2 <i>Is the waste liquid waste?</i>	No.
3 <i>Is the waste pre-classified?</i>	No.
4 <i>Does the waste possess hazardous characteristics</i>	No.

Step	Material Observation
5 <i>Waste classification using chemical assessment.</i>	<p>Yes. Soil sample (TP52_0.0-0.2) returned analytical results exceeding the general solid waste contaminant threshold (CT1) criteria for lead outlined in the NSW EPA <i>Waste Classification Guidelines</i> (2014). As such, a toxicity characteristic leaching potential (TCLP) preparation of this soil sample (TP52_0.0-0.2) and subsequent analysis of the elutriate for lead was completed. The analytical result (0.03 mg/L) did not exceed the general solid waste TCLP1 maximum concentration (5 mg/L) outlined in the NSW EPA <i>Waste Classification Guidelines</i> (2014). As TCLP analysis was undertaken, a revised specific contaminant concentration (SCC1) was applicable (1,500 mg/kg). The results did not exceed the General Solid Waste TCLP1/SCC1 criteria outlined in the NSW EPA <i>Waste Classification Guidelines</i> (2014).</p> <p>The remaining laboratory analytical results did not exceed the General Solid Waste CT1 criteria outlined in the NSW EPA <i>Waste Classification Guidelines</i> (2014).</p> <p>Refer to laboratory analytical results summary Table 5.</p>
6 <i>Is the waste putrescible or non-putrescible?</i>	Non-putrescible.

Based on AG's assessment of fieldwork observations and laboratory analytical data, and as of the date of this report, the material assessed would classify as:

- **General Solid Waste (Special Waste)**

This conclusion must be read in conjunction with the statement of limitations presented in **Section 15**.

14. CONCLUSIONS AND RECOMMENDATIONS

Based on AG's assessment of the desktop review information, fieldwork data and laboratory analytical data, in the context of the proposed redevelopment scenario, AG makes the following conclusions:

Data Gap Assessment (previously inaccessible areas)

- the detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable direct contact human health exposure risk;
- fibrous asbestos and asbestos fines detected in the soils assessed, may present an unacceptable human health exposure risk, at sampling points **TP53** and **TP57**;
- the detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present an unacceptable inhalation / vapour intrusion human health exposure risk; and
- the detected concentrations of identified contaminants of potential concern in the soils assessed are considered unlikely to present a petroleum hydrocarbon management limit risk.

Chemical Delineation Assessment

- the extent of previously identified lead contamination at sampling points **BH02**, **BH22** and **BH24**, is considered to have been adequately delineated; and
- the extent of previously identified benzo(a)pyrene contamination at sampling points **BH04**, **BH16** and **BH23**, is considered to have been adequately delineated.

Asbestos Delineation Assessment

- the extent of previously identified asbestos contamination at sampling points **SS02**, **SS03**, **BH30**, **BH40**, **BH41** and **TP53** is considered to have been adequately delineated;
- the extent of previously identified asbestos contamination at sampling point **BH07**, has not been adequately delineated; and
- Non-friable ACM identified at sampling point **TP04B** may present an unacceptable human health exposure risk and has not been adequately delineated.

Indicative Waste Classification

- General Solid Waste (Special Waste).

Based on these conclusions, AG makes the following recommendations:

- further supplementary contamination assessments could be undertaken to further understand and delineate the nature and extent of asbestos contamination identified at sampling points **TP04B**, **TP07A** and **TP57**; or
- alternatively, AG (2018c) could be updated to include the recently identified contamination risks onsite and outline the appropriate remedial measures to adequately remove the contamination pathway and associated human health exposure risks. It is recommended that any update to AG (2018c) be undertaken by an appropriately experienced environmental consultant.

This report, including its conclusions and recommendations, must be read in conjunction with the limitations presented in **Section 15**.

15. STATEMENT OF LIMITATIONS

The findings presented in this report are based on specific searches of relevant, government historical databases and anecdotal information that were made available during the course of this investigation. To the best of our knowledge, these observations represent a reasonable interpretation of the general condition of the site at the time of report completion.

This report has been prepared solely for the use of the client to whom it is addressed and no other party is entitled to rely on its findings.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance Geotechnical Pty Ltd. Should information become available regarding conditions at the site including previously unknown sources of contamination, AG reserves the right to review the report in the context of the additional information.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to AG's engagement. The report must not be used for any purpose other than the purpose specified at the time AG was engaged to prepare the report.

Logs, figures, and drawings are generated for this report based on individual AG consultant interpretations of nominated data, as well as observations made at the time site walkover/s were completed.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, AG reserves the right to review and amend this report.

16. REFERENCES

AG 2018a, *'Stage 1 Preliminary Site Investigation, Portion of Lot 1 in DP837179 (Lot 10 in DP1232584), Meadowbank Education and Employment Precinct Schools Project, 2 Rhodes Street, Meadowbank, NSW'*, dated June 2019, ref: 6179-ER-1-1 REV5;

AG 2018b, *'Stage 2 Detailed Site Investigation, Portion of Lot 1 in DP837179 (Lot 10 in DP1232584), Meadowbank Education and Employment Precinct Schools Project, 2 Rhodes Street, Meadowbank, NSW'*, dated June 2019, ref: 6179-ER-1-2 REV6;

AG 2018c, *'Remedial Action Plan, Portion of Lot 1 in DP837179 (Lot 10 in DP1232584), Meadowbank Education and Employment Precinct Schools Project, 2 Rhodes Street, Meadowbank, NSW'*, dated 12 June 2019, ref: 6179-ER-1-3 REV5.

National Environment Protection Council (NEPC) 1999a, *'Schedule B (1) Guideline on Investigation Levels for Soil and Groundwater, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'*.

National Environment Protection Council (NEPC) 1999b, *'Schedule B (2) Guideline on Site Characterisation, National Environment Protection (Assessment of Site Contamination) Measure (NEPM) as amended in May 2013'*.

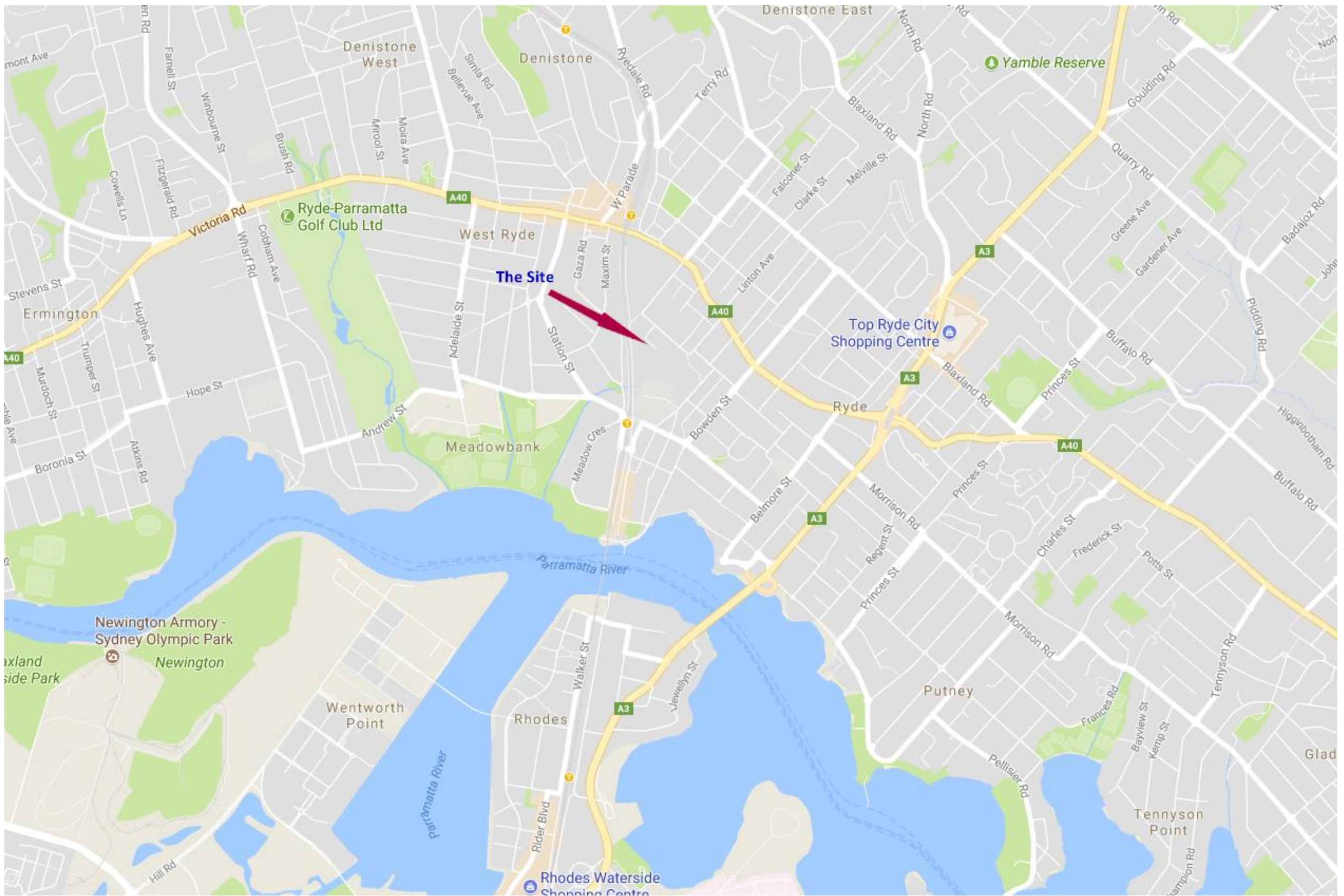
NSW DEC 2006, *'Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)'*.

NSW EPA 1995, *'Contaminated Sites: Sampling Design Guidelines'*.

NSW OEH 2011, *'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites'*.

WA DOH 2009, *'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'* dated May 2009.

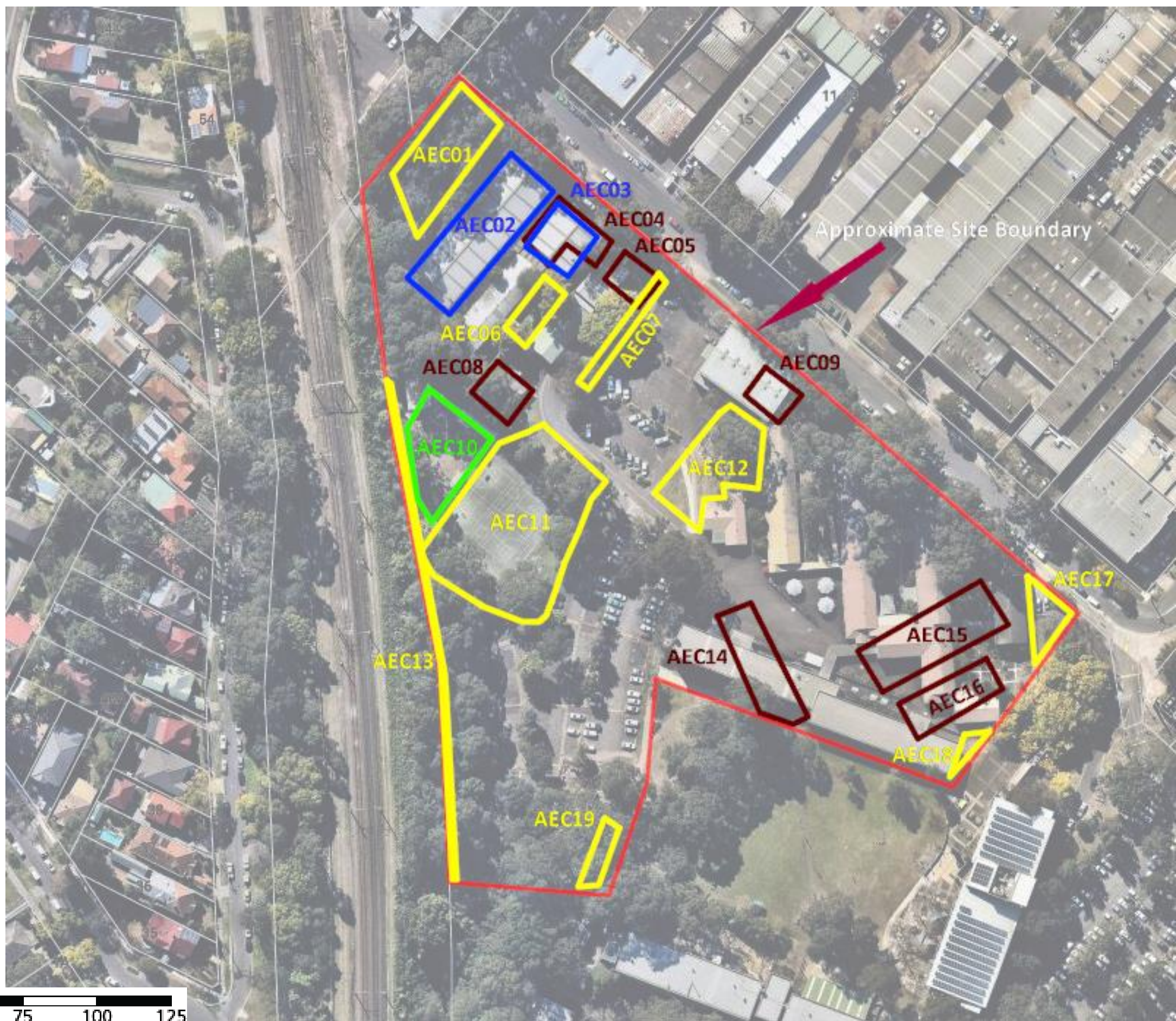
SITE FIGURES





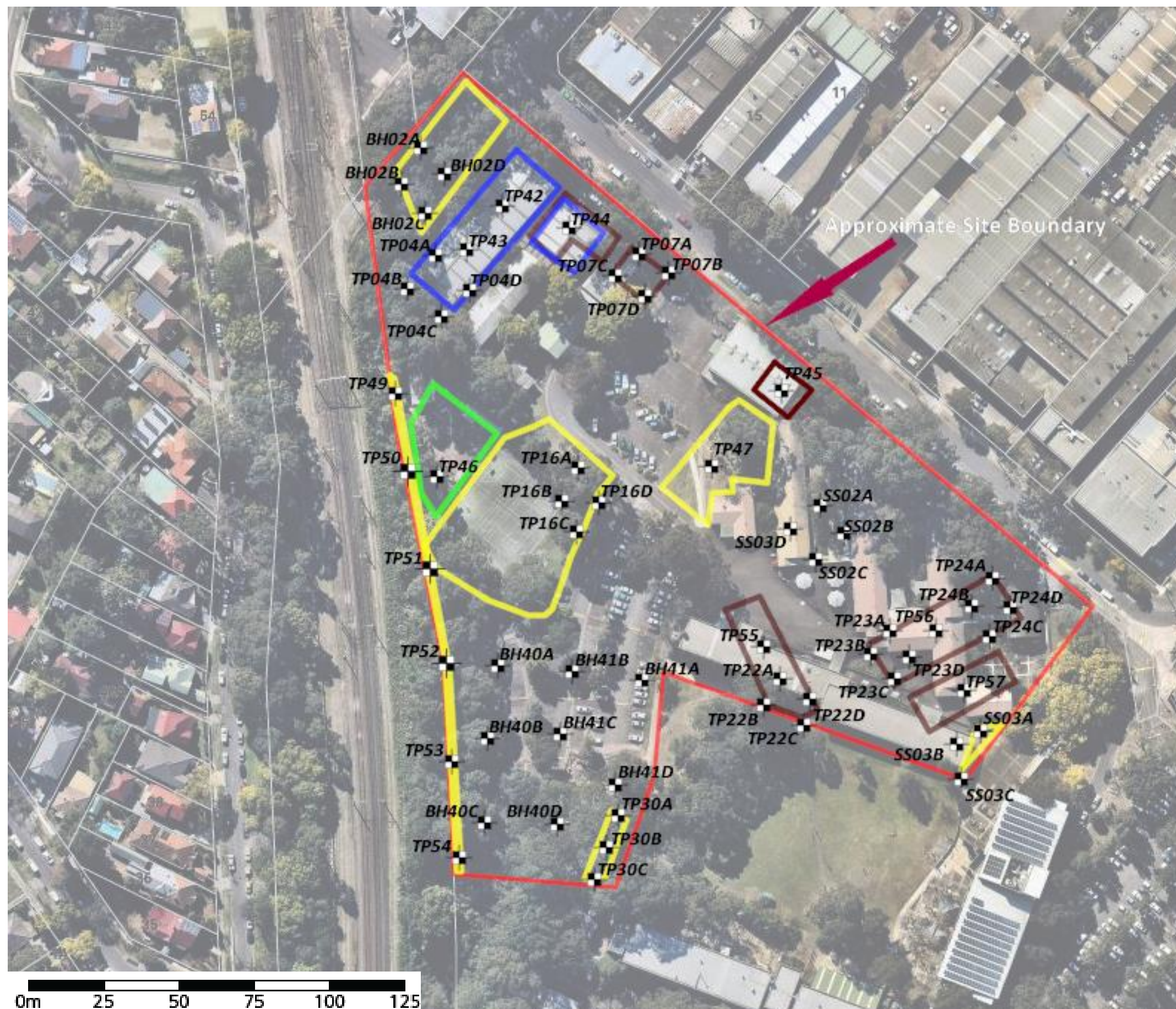
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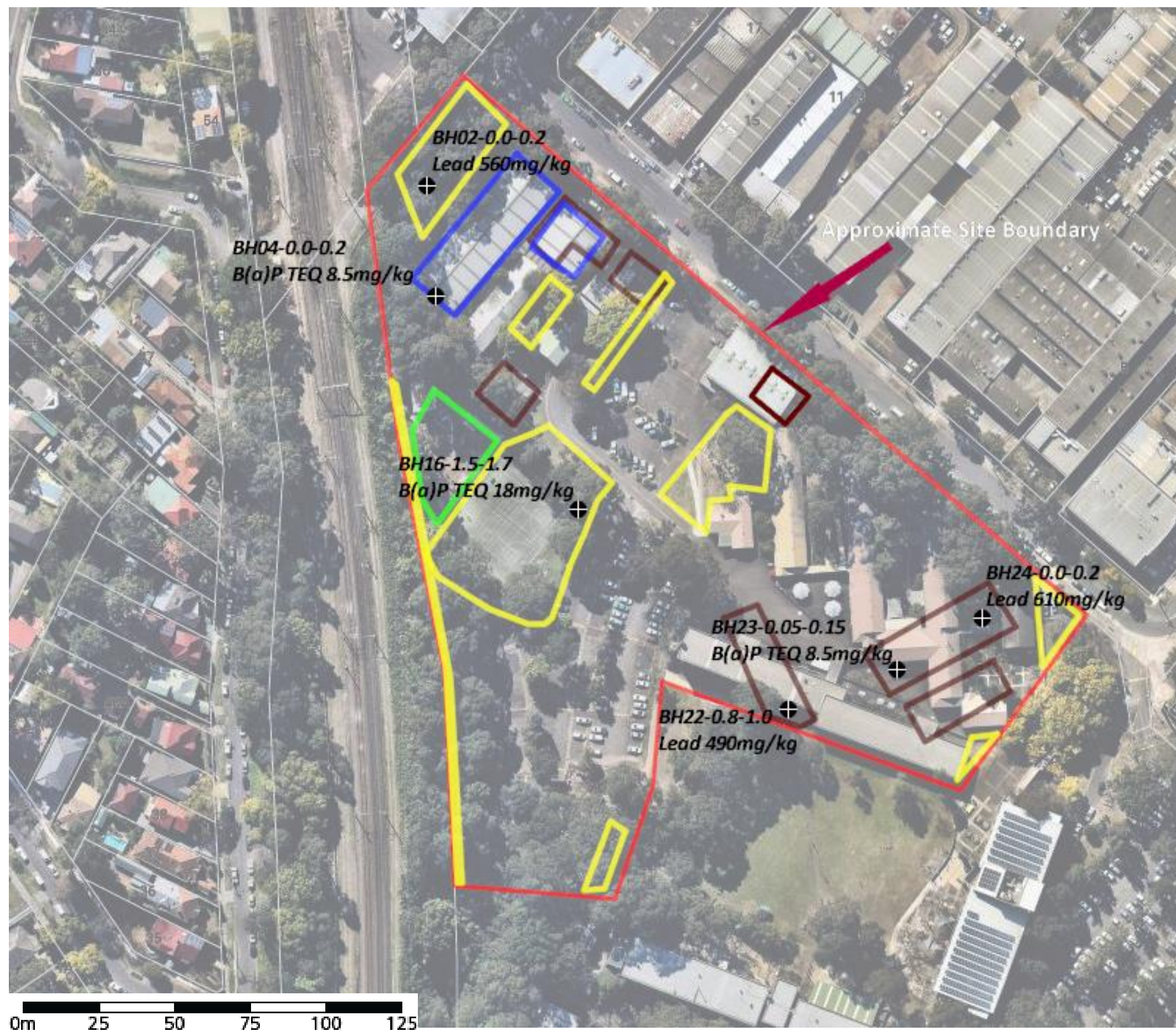


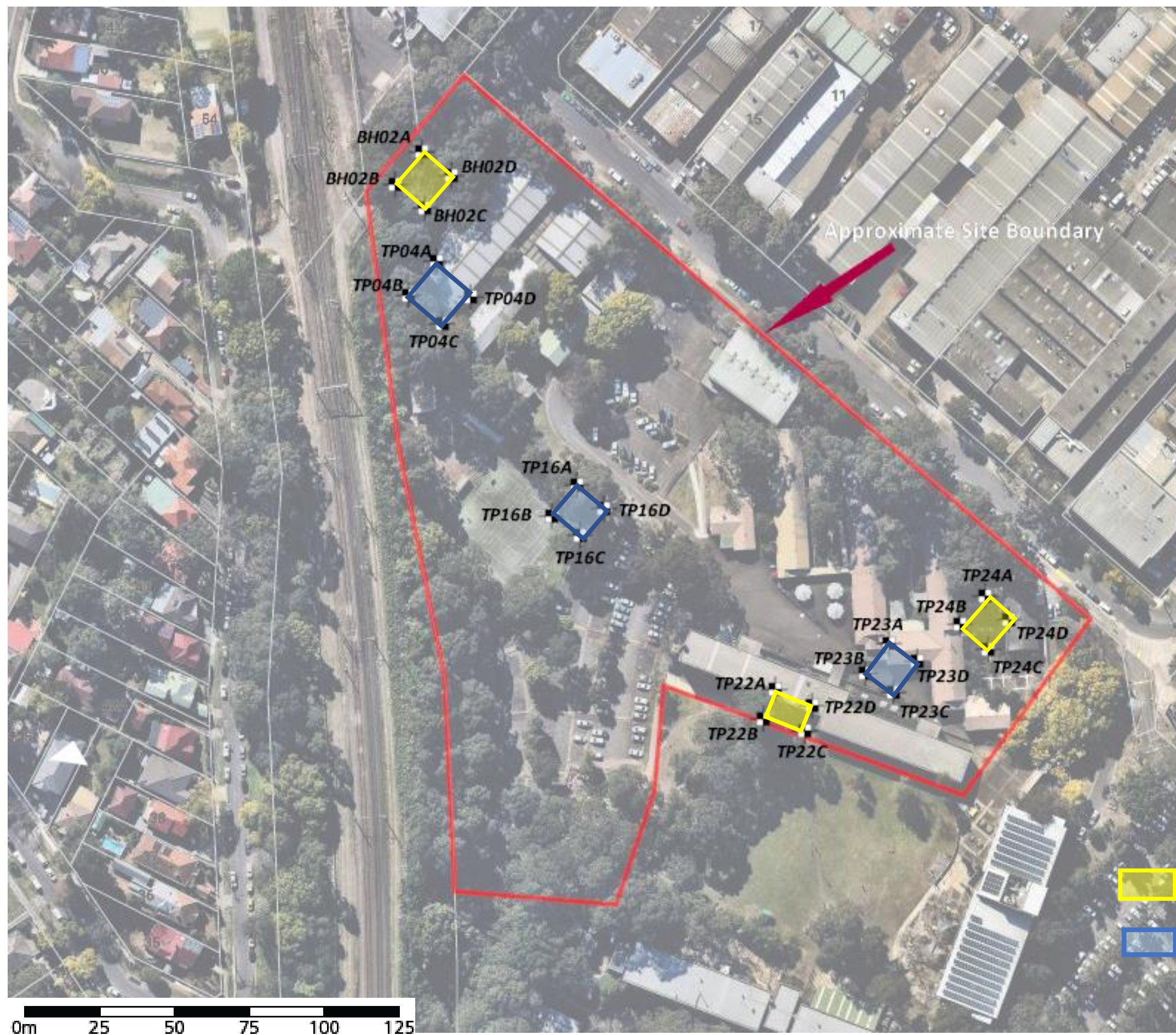


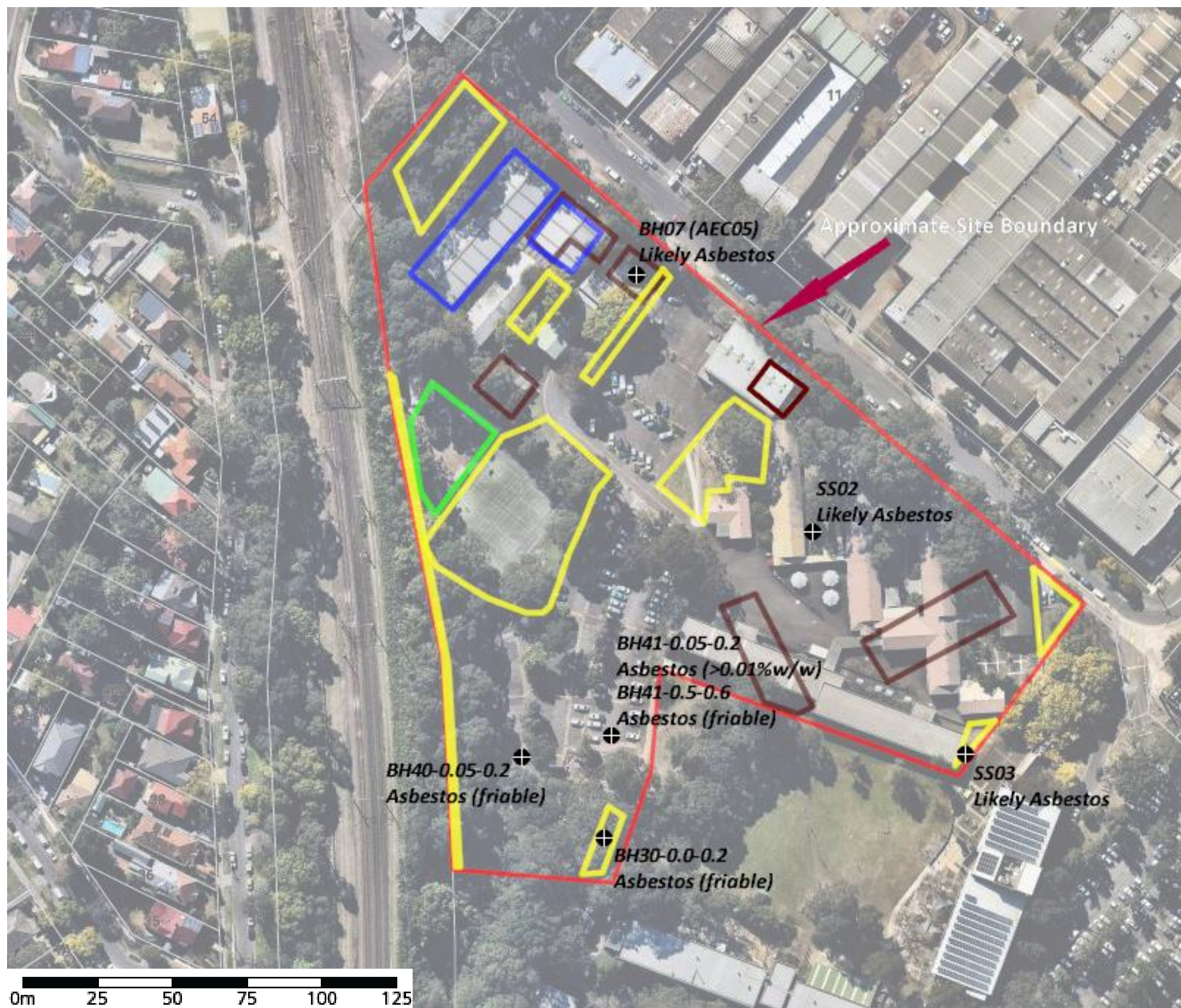
0m 25 50 75 100 125















Legend

 Delineated Extent of Asbestos Contamination.

 Unknown Extent of Asbestos Contamination.

DATA SUMMARY TABLES

	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	6	0	0							< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	0	0							< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	10	0	0							< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	300	0	0							< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	0	0							< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	-	-	0	0							< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	0	0							< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	0	0							
Asbestos	Total PCB*	mg/kg	0.1	-	-	-	-	-	-	1	0	0							
	Asbestos Detected Insoil	No Unit	Detection	Detected	-	-	-	-	-	-	-	-						Not Detected	
	Estimated Fibres	% w/w	0.001	0.001	-	-	-	-	-	-	-	-						<0.01	
	Non-friable ACM	No Unit	Type	Detected	-	-	-	-	-	-	-	-						N.A.	

- Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011
- Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)
- Highlighted concentration exceeds the adopted site criteria - Management Limits for TPH Fractions F1 - F4 in soil (mg/Kg) - NEPC 2013
- Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
- Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013
- No published criteria or sample not analysed
- NL

Not Limiting

	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	6	0	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	0	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	10	0	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	300	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	0	0	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*		mg/kg	0.1	-	-	-	-	-	-	1	0	0		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Asbestos	Asbestos Detected Insoil	No Unit	Detection	Detected	-	-	-	-	-	-	-	-		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Estimated Fibres	% w/w	0.001	0.001	-	-	-	-	-	-	-	-		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Non-friable ACM	No Unit	Type	Detected	-	-	-	-	-	-	-	-		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

- Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011
- Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)
- Highlighted concentration exceeds the adopted site criteria - Management Limits for TPH Fractions F1 - F4 in soil (mg/Kg) - NEPC 2013
- Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
- Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013
- No published criteria or sample not analysed
- NL

Not Limiting

	Heptachlor	mg/kg	0.05	-	-	-	-	-	-	6	0	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Heptachlor epoxide	mg/kg	0.05	-	-	-	-	-	-	-	0	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Hexachlorobenzene	mg/kg	0.05	-	-	-	-	-	-	10	0	0	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Methoxychlor	mg/kg	0.05	-	-	-	-	-	-	300	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	Toxaphene	mg/kg	1.0	-	-	-	-	-	-	-	0	0	< 1	< 1	< 1	< 1	< 1	< 1
	Vic EPA IWRG 621 OCP 9total)	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	Vic EPA IWRG 621 Other OCP (total)	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	Aroclor-1016	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1221	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Aroclor-1232	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1242	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1248	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1254	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Aroclor-1260	mg/kg	0.1	-	-	-	-	-	-	-	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*		mg/kg	0.1	-	-	-	-	-	-	1	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Asbestos	Asbestos Detected Insoil	No Unit	Detection	Detected	-	-	-	-	-	-	-	-	Detected	Not Detected	Not Detected	Not Detected	Not Detected	Detected
	Estimated Fibres	% w/w	0.001	0.001	-	-	-	-	-	-	-	-	Detected Chrysotile, Amosite and Crocidolite Asbestos Detected	<0.01	<0.01	<0.01	<0.01	Chrysotile Asbestos Detected
	Non friable ACM	No Unit	Type	Detected	-	-	-	-	-	-	-	-	<0.001	N.A.	N.A.	N.A.	N.A.	0.0013

- Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011
- Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)
- Highlighted concentration exceeds the adopted site criteria - Management Limits for TPH Fractions F1 - F4 in soil (mg/Kg) - NEPC 2013
- Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013
- Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013
- No published criteria or sample not analysed
- NL

Not Limiting

Table 2
Tafe - See Street, Meadowbank, NSW
Chemical Delineation Results & Adopted Site Criteria
9280-ER-1-1

								Sample ID		SE174488.002	S19-Jn21896	S19-Jn21897	S19-Jn21898	S19-Jn21899		SE174488.004	S19-Jn21904	S19-Jn21905	S19-Jn21906	S19-Jn21907	S19-Jn21908
								Reference		BH02-0.0-0.2	BH02A-0.0-0.3	BH02B-0.0-0.3	BH02C-0.0-0.3	BH02D-0.0-0.3		BH04-0.0-0.2	TP04A-0.0-0.2	TP04A-0.9-1.1	TP04B-0.0-0.2	TP04C-0.0-0.2	TP04C-0.8-1.0
								Date Sampled		13/1/2018	19/6/2019	19/6/2019	19/6/2019	19/6/2019		13/1/2018	19/6/2019	19/6/2019	19/6/2019	19/6/2019	19/6/2019
								Sample Matrix		Soil	Soil	Soil	Soil	Soil		Soil	Soil	Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)		Health Investigation Levels for Soil Contaminants - NEPC 2013														
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential		Residential A	Data Set Minimum	Data Set Maximum												
					0 m to <1 m	1 m to <2 m															
	Lead, Pb	mg/kg	5	-	-	-	300	4	610	560	5.9	8.2	110	85							
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	0	1							0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthylene	mg/kg	0.5	-	-	-	-	0	8							0.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	-	-	-	-	2	15							1.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	1	14							5.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	1	13							6.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	1	18							8.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	3	1	18							8.5	0.6	0.6	0.6	0.6	0.6
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	1	18							8.5	1.2	1.2	1.2	1.2	1.2
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	1	14							8.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	1	5							3.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	1	6							1.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	-	-	-	-	1	12							4.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	1	1							0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	-	-	-	-	1	55							11	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluorene	mg/kg	0.5	-	-	-	-	0	7							0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	4	6							4.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	1,400	3	NL	-	0	4.2							0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	-	-	-	-	1	73							4.6	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Pyrene	mg/kg	0.5	-	-	-	-	1	51							8.3	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Total PAH (18)	mg/kg	0.5	-	-	-	-	1	290							60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011

Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)

Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

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No published criteria or sample not analysed

NL

Not Limiting

Table 2
Tafe - See Street, Meadowbank, NSW
Chemical Delineation Results & Adopted Site Criteria
9280-ER-1-1

Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)		Health Investigation Levels for Soil Contaminants - NEPC 2013															
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential		Residential A	Data Set Minimum														
					0 m to <1 m	1 m to <2 m																
	Lead, Pb	mg/kg	5	-	-	-	300	4														
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	0	< 0.5	< 0.5	< 0.5		1.4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Acenaphthylene	mg/kg	0.5	-	-	-	-	0	< 0.5	< 0.5	< 0.5		8.0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Anthracene	mg/kg	0.5	-	-	-	-	2	< 0.5	< 0.5	< 0.5		15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		14	0.8	< 0.5	< 0.5	< 0.5	0.7	0.7	< 0.5	< 0.5	
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		13	0.8	< 0.5	< 0.5	< 0.5	0.8	0.7	< 0.5	< 0.5	
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		18	1	< 0.5	< 0.5	< 0.5	1	0.8	< 0.5	< 0.5	
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	3	1	0.6	0.6	0.6		18	1.3	0.6	0.6	0.6	1.3	1.1	0.6	0.6	
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	1	1.2	1.2	1.2		18	1.6	1.2	1.2	1.2	1.5	1.4	1.2	1.2	
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		14	0.6	< 0.5	< 0.5	< 0.5	0.6	0.5	< 0.5	< 0.5	
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		5.3	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		6.4	0.6	< 0.5	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	
	Chrysene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		12	0.8	< 0.5	< 0.5	< 0.5	0.7	0.7	< 0.5	< 0.5	
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		0.7	< 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		55	1.6	< 0.5	< 0.5	0.7	1.4	1.6	< 0.5	< 0.5	
	Fluorene	mg/kg	0.5	-	-	-	-	0	< 0.5	< 0.5	< 0.5		7.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	4	< 0.5	< 0.5	< 0.5		5.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Napthalene	mg/kg	0.5	1,400	3	NL	-	0	< 0.5	< 0.5	< 0.5		4.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
	Phenanthrene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		73	0.6	< 0.5	< 0.5	< 0.5	0.6	0.6	< 0.5	< 0.5	
	Pyrene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		51	1.4	< 0.5	< 0.5	0.6	1.4	1.4	< 0.5	< 0.5	
Total PAH (18)	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5		290	7.7	< 0.5	< 0.5	1.3	6.7	6.2	< 0.5	< 0.5		

Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011

Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)

Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

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No published criteria or sample not analysed

NL

Not Limiting

Table 2
Tafe - See Street, Meadowbank, NSW
Chemical Delineation Results & Adopted Site Criteria
9280-ER-1-1

Table 2 Tafe - See Street, Meadowbank, NSW Chemical Delineation Results & Adopted Site Criteria 9280-ER-1-1								Sample ID		SE174689.027	S19-Jn32732	S19-Jn32733	S19-Jn32734	S19-Jn32735	S19-Jn21920	S19-Jn21921	S19-Jn21922	S19-Jn21923		SE174488.028	S19-Jn21924
								Reference		BH22-0.8-1.0	TP22A-0.0-0.2	TP22A-1.0-1.2	TP22B-0.0-0.2	TP22B-0.9-1.1	TP22C-0.0-0.3	TP22C1.1-1.3	TP22D-0.0-0.2	TP22D-1.1-1.3		BH23-0.05-0.15	TP23A-0.1-0.4
								Date Sampled		14/1/2018	19/6/2019	19/6/2019	19/6/2019	19/6/2019	19/6/2019	19/6/2019	19/6/2019	19/6/2019		14/1/2018	19/6/2019
								Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil		Soil	Soil
Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)		Health Investigation Levels for Soil Contaminants - NEPC 2013	Data Set Minimum													
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential		Residential A														
					0 m to <1 m	1 m to <2 m															
	Lead, Pb	mg/kg	5	-	-	-	300	4		490	43	7.3	290	150	160	170	130	460			
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	0											0.2	< 0.5	
	Acenaphthylene	mg/kg	0.5	-	-	-	-	0											1.6	< 0.5	
	Anthracene	mg/kg	0.5	-	-	-	-	2											1.8	< 0.5	
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	1											5.4	< 0.5	
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	1											6.2	< 0.5	
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	1											8.4	< 0.5	
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	3	1											8.4	0.6	
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	1											8.4	1.2	
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	1											6.0	< 0.5	
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	1											3.2	< 0.5	
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	1											2.8	< 0.5	
	Chrysene	mg/kg	0.5	-	-	-	-	1											4.9	< 0.5	
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	1											0.5	< 0.5	
	Fluoranthene	mg/kg	0.5	-	-	-	-	1											7.9	< 0.5	
	Fluorene	mg/kg	0.5	-	-	-	-	0											1.0	< 0.5	
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	4											3.9	< 0.5	
	Naphthalene	mg/kg	0.5	1,400	3	NL	-	0											1.0	< 0.5	
	Phenanthrene	mg/kg	0.5	-	-	-	-	1											7.8	< 0.5	
	Pyrene	mg/kg	0.5	-	-	-	-	1											7.9	< 0.5	
Total PAH (18)	mg/kg	0.5	-	-	-	-	1											62	< 0.5		

Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011

Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)

Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

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No published criteria or sample not analysed

NL

Not Limiting

Table 2
Tafe - See Street, Meadowbank, NSW
Chemical Delineation Results & Adopted Site Criteria
9280-ER-1-1

Table 2 Tafe - See Street, Meadowbank, NSW Chemical Delineation Results & Adopted Site Criteria 9280-ER-1-1								Sample ID	S19-Jn21925	S19-Jn21926	S19-Jn21927		SE174488.029	SE174689.029	S19-Jn20038	S19-Jn20039	S19-Jn20040	S19-Jn20041	S19-Jn20042
								Reference	TP23B-0.1-0.4	TP23C-0.1-0.4	TP23D-0.1-0.4		BH24-0.0-0.2	BH24-0.2-0.4	TP24A_0.1-0.4	TP24B_0.0-0.2	TP24B_0.3-0.5	TP24C_0.1-0.4	TP24D_0.1-0.4
								Date Sampled	19/6/2019	19/6/2019	19/6/2019		14/1/2018	14/1/2018	18/6/2019	18/6/2019	18/6/2019	18/6/2019	18/6/2019
								Sample Matrix	Soil	Soil	Soil		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Screening Levels for Direct Contact (mg/kg) - CRC Care 2011	Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)		Health Investigation Levels for Soil Contaminants - NEPC 2013												
				HSL - A Residential (Low Density)	HSL A & HSL B - Low - High density Residential		Residential A	Data Set Minimum											
					0 m to <1 m	1 m to <2 m													
	Lead, Pb	mg/kg	5	-	-	-	300	4					610	4	25	84	10	58	< 5
PAH	Acenaphthene	mg/kg	0.5	-	-	-	-	0	< 0.5	< 0.5	< 0.5								
	Acenaphthylene	mg/kg	0.5	-	-	-	-	0	< 0.5	< 0.5	< 0.5								
	Anthracene	mg/kg	0.5	-	-	-	-	2	< 0.5	< 0.5	< 0.5								
	Benzo(a)anthracene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Benzo(a)pyrene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.5	-	-	-	3	1	0.6	0.6	0.6								
	Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.5	-	-	-	-	1	1.2	1.2	1.2								
	Benzo(b&j)fluoranthene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Benzo(ghi)perylene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Benzo(k)fluoranthene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Chrysene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Dibenzo(ah)anthracene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Fluoranthene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Fluorene	mg/kg	0.5	-	-	-	-	0	< 0.5	< 0.5	< 0.5								
	Indeno(1,2,3-cd)pyrene	mg/kg	0.5	-	-	-	-	4	< 0.5	< 0.5	< 0.5								
	Naphthalene	mg/kg	0.5	1,400	3	NL	-	0	< 0.5	< 0.5	< 0.5								
	Phenanthrene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
	Pyrene	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5								
Total PAH (18)	mg/kg	0.5	-	-	-	-	1	< 0.5	< 0.5	< 0.5									

Highlighted concentration exceeds the adopted site criteria - Screening Levels for Direct Contact (mg/kg) - CRC Care 2011

Highlighted concentration exceeds the adopted site criteria - Inhalation / Vapour Intrusion HSLs (mg/kg) - NEPC 2013 (SAND)

Highlighted concentration exceeds the adopted site criteria - Health Investigation Levels for Soil Contaminants - NEPC 2013

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No published criteria or sample not analysed

NL

Not Limiting

Table 3
Tafe - See Street, Meadowbank, NSW
Asbestos Delineation Results & Adopted Site Criteria
9280-ER-1-1

Table 3 Tafe - See Street, Meadowbank, NSW Asbestos Delineation Results & Adopted Site Criteria 9280-ER-1-1					Sample ID		19-Jn21939			SE174488.007	SE174689.007	S19-Jn21912	S19-Jn21913	S19-Jn21914	S19-Jn21915		SE174488.038	SE174689.037	SE174689.038	SE174488.039	S19-Jn20044
					Reference		FCS-TP04B			BH07-0.0-0.2	BH07-0.3-0.5	TP07A-0.1-0.4	TP07B-0.1-0.4	TP07C-0.1-0.4	TP07D-0.1-0.4		BH30-0.0-0.2	BH30-0.5-0.6	BH30-0.9-1.0	BH30-1.4-1.5	TP30A_1.7-1.9
					Date Sampled		19/06/2019			13/1/2018	13/1/2018	19/6/2019	19/6/2019	19/6/2019	19/6/2019		13/1/2018	13/1/2018	13/1/2018	13/1/2018	18/6/2019
					Sample Matrix		Fragment			Soil	Soil	Soil	Soil	Soil	Soil		Soil	Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Asbestos Health Screening Level (w/w) - NEPC 2013																	
				Residential A	Data Set Minimum	Data Set Maximum															
Asbestos	Asbestos Detected Insoil	No Unit	Detection	Detected	0	0	N.A.		Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected		Detected	Not Detected	Not Detected	N.A.	Detected	
	Estimated Fibres	% w/w	0.001	0.001	0	0	N.A.		<0.01	N.A.	<0.001	<0.001	<0.001	<0.001		<0.01	N.A.	N.A.	N.A.	<0.001	
	Non-friable ACM	No Unit	Type	Detected			Chrysotile and Amosite Asbestos Detected		N.A.	N.A.	Chrysotile Asbestos Detected	N.A.	N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.	

Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013

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No published criteria or sample not analysed

N.A.
Not Applicable or Not Analysed

Table 3
Tafe - See Street, Meadowbank, NSW
Asbestos Delineation Results & Adopted Site Criteria
9280-ER-1-1

					Sample ID	S19-Jn20045	S19-Jn20046	S19-Jn20047	S19-Jn20048		SE174488.053	SE174689.049	SE174488.054	S19-Jn24200	S19-Jn24201	S19-Jn24202	S19-Jn24203	S19-Jn20049	S19-Jn20050	S19-Jn20051
					Reference	TP30B_0.0-0.2	TP30B_0.9-1.1	TP30C_0.9-1.1	TP30C_1.7-1.9		BH40-0.05-0.2	BH40-0.5-0.6	BH40-0.9-1.0	BH40A-0.1-0.3	BH40A-0.8-1.0	BH40B-0.1-0.3	BH40B-0.8-1.0	BH40C_0.1-0.3	BH40C_1.7-1.9	BH40D_0.0-0.2
					Date Sampled	18/6/2019	18/6/2019	18/6/2019	18/6/2019		13/1/2018	13/1/2018	13/1/2018	20/6/2019	20/6/2019	20/6/2019	20/6/2019	18/6/2019	18/6/2019	18/6/2019
					Sample Matrix	Soil	Soil	Soil	Soil		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Asbestos Health Screening Level (w/w) - NEPC 2013																
				Residential A	Data Set Minimum															
Asbestos	Asbestos Detected Insoil	No Unit	Detection	Detected	0	Not Detected	Not Detected	Not Detected	Not Detected		Detected	Not Detected	N.A.	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Estimated Fibres	% w/w	0.001	0.001	0	<0.001	<0.001	<0.001	<0.001		<0.01	N.A.	N.A.	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Non-friable ACM	No Unit	Type	Detected		Chrysotile Asbestos Detected	Chrysotile Asbestos Detected	Chrysotile Asbestos Detected	Chrysotile Asbestos Detected		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013

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No published criteria or sample not analysed

N.A.
Not Applicable or Not Analysed

Table 3
Tafe - See Street, Meadowbank, NSW
Asbestos Delineation Results & Adopted Site Criteria
9280-ER-1-1

					Sample ID	S19-Jn20052		SE174488.055	SE174689.050	SE174689.051	S19-Jn24204	S19-Jn24205	S19-Jn24206	S19-Jn24207	S19-Jn24208	S19-Jn24209	S19-Jn24210	S19-Jn24211	S19-Jn24212	S19-Jn24213
					Reference	BH40D_0.9-1.1		BH41-0.05-0.2	BH41-0.5-0.6	BH41-0.9-1.0	BH41A-0.1-0.3	BH41A-0.9-1.1	BH41B-0.0-0.2	BH41B-0.8-1.0	BH41C-0.1-0.3	BH41C-0.9-1.1	BH41D-0.0-0.2	BH41D-0.9-1.1	BH40A-1.2-1.4	BH40B-1.4-1.6
					Date Sampled	18/6/2019		13/1/2018	13/1/2018	13/1/2018	20/6/2019	20/6/2019	20/6/2019	20/6/2019	20/6/2019	20/6/2019	20/6/2019	20/6/2019	20/6/2019	20/6/2019
					Sample Matrix	Soil		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Asbestos Health Screening Level (w/w) - NEPC 2013																
				Residential A	Data Set Minimum															
Asbestos	Asbestos Detected Insoil	No Unit	Detection	Detected	0	Detected		Detected	Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Estimated Fibres	% w/w	0.001	0.001	0	<0.001		>0.01	N.A.	N.A.	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Non-friable ACM	No Unit	Type	Detected		N.A.		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013

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No published criteria or sample not analysed

N.A.
Not Applicable or Not Analysed

Table 3
Tafe - See Street, Meadowbank, NSW
Asbestos Delineation Results & Adopted Site Criteria
9280-ER-1-1

					Sample ID	S19-Jn24214	S19-Jn24215	S19-Jn24216	S19-Jn24217		SE174689.053	S19-Jn21900	S19-Jn21901	S19-Jn21902	S19-Jn21903		SE174689.054	S19-Jn20075	S19-Jn20076	S19-Jn20077
					Reference	BH41A-1.8-2.0	BH41B-1.4-1.6	BH41C-1.8-2.0	BH41D-1.8-2.0		SS02	SS02A-0.0-0.3	SS02B-0.0-0.3	SS02C-0.0-0.3	SS02D-0.0-0.3		SS03	SS03A_0.5-0.7	SS03B_0.8-1.0	SS03C_0.0-0.2
					Date Sampled	20/6/2019	20/6/2019	20/6/2019	20/6/2019		14/1/2018	19/6/2019	19/6/2019	19/6/2019	19/6/2019		14/1/2018	18/6/2019	18/6/2019	18/6/2019
					Sample Matrix	Soil	Soil	Soil	Soil		Soil	Soil	Soil	Soil	Soil		Soil	Soil	Soil	Soil
Group	Analyte	Units	PQL	Asbestos Health Screening Level (w/w) - NEPC 2013																
				Residential A	Data Set Minimum															
Asbestos	Asbestos Detected Insoil	No Unit	Detection	Detected	0	Not Detected	Not Detected	Not Detected	Not Detected		Not Detected	Not Detected	Not Detected	Not Detected	Detected		Not Detected	Not Detected	Not Detected	Not Detected
	Estimated Fibres	% w/w	0.001	0.001	0	<0.001	<0.001	<0.001	<0.001		N.A.	<0.001	<0.001	<0.001	0.0011		N.A.	<0.001	<0.001	<0.001
	Non-friable ACM	No Unit	Type	Detected		N.A.	N.A.	N.A.	N.A.		N.A.	N.A.	N.A.	N.A.	N.A.		N.A.	N.A.	N.A.	N.A.

Highlighted concentration exceeds the adopted site criteria - Asbestos Health Screening Level (w/w) - NEPC 2013

-
No published criteria or sample not analysed

N.A.
Not Applicable or Not Analysed

Table 4
Tafe - See Street, Meadowbank, NSW
Relative Percent Difference
9280-ER-1-1

			Sample ID	TP54_0.0-0.2	DUP01		TP54_0.0-0.2	DUP-01A		TP30C_0.0-0.2	DUP02		TP30C_0.0-0.2
			Reference	S19-Jn20062	S19-Jn20066		S19-Jn20062	ES1918836-001		S19-Jn20083	S19-Jn20067		S19-Jn20083
			Date Sampled	18/6/2019	18/6/2019		18/6/2019	18/6/2019		18/6/2019	18/6/2019		18/6/2019
			Sample Matrix	Soil	Soil		Soil	Soil		Soil	Soil		Soil
Group	Analyte	Units	LOR			RPD (%)			RPD (%)			RPD (%)	
Metals	Arsenic	mg/kg	2	4	3	25	4	<5	-	6	3	64	6
	Cadmium	mg/kg	0.4	< 0.4	< 0.4	-	< 0.4	<1	-	< 0.4	< 0.4	-	< 0.4
	Chromium	mg/kg	5	15	14	7	15	48	105	17	13	27	17
	Copper	mg/kg	5	36	27	29	36	36	0	27	28	4	27
	Lead	mg/kg	5	67	53	23	67	183	93	63	43	38	63
	Mercury	mg/kg	0.1	< 0.1	< 0.1	-	< 0.1	<0.1	-	0	< 0.1	-	0
	Nickel	mg/kg	5	9	11	23	9	8	8	16	22	32	16
	Zinc	mg/kg	5	170	120	34	170	190	11	110	89	21	110

RPD exceeding criteria

- Primary, Duplicate or Triplicate less than LOR and/or not analysed

Table 4
Tafe - See Street, Meadowbank, NSW
Relative Percent Difference
9280-ER-1-1

			Sample ID	DUP-02A		TP30A_0.0-0.2	DUP03		TP30A_0.0-0.2	DUP-03A		TP57_0.0-0.2	DUP04	
			Reference	ES1918836-002		S19-Jn20043	S19-Jn20068		S19-Jn20043	ES1918836-003		S19-Jn20064	S19-Jn20069	
			Date Sampled	18/6/2019		18/6/2019	18/6/2019		18/6/2019	18/6/2019		18/6/2019	18/6/2019	
			Sample Matrix	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Group	Analyte	Units	LOR		RPD (%)			RPD (%)			RPD (%)			RPD (%)
Metals	Arsenic	mg/kg	2	5	21	4	5	20	4	20	138	4	4	0
	Cadmium	mg/kg	0.4	<1	-	< 0.4	< 0.4	-	< 0.4	<1	-	< 0.4	< 0.4	-
	Chromium	mg/kg	5	15	13	7	10	35	7	14	67	14	17	19
	Copper	mg/kg	5	30	11	11	29	90	11	34	102	< 5	24	-
	Lead	mg/kg	5	62	2	33	78	81	33	118	113	18	49	93
	Mercury	mg/kg	0.1	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-	< 0.1	0	-
	Nickel	mg/kg	5	17	6	< 5	6	-	< 5	7	-	< 5	10	-
	Zinc	mg/kg	5	128	15	18	78	125	18	93	135	29	130	127

RPD exceeding criteria

- Primary, Duplicate or Triplicate less than LOR and/or not analysed

Table 4
Tafe - See Street, Meadowbank, NSW
Relative Percent Difference
9280-ER-1-1

			Sample ID	TP57_0.0-0.2	DUP-04A		TP23D-0.1-0.4	DUP-05		TP23D-0.1-0.4	DUP-5A	
			Reference	S19-Jn20064	ES1918836-004		S19-Jn21927	S19-Jn21938		S19-Jn21927	ES1919077-001	
			Date Sampled	18/6/2019	18/6/2019		19/6/2019	19/6/2019		19/6/2019	19/6/2019	
			Sample Matrix	Soil	Soil		Soil	Soil		Soil	Soil	
Group	Analyte	Units	LOR			RPD (%)			RPD (%)			RPD (%)
Metals	Arsenic	mg/kg	2	4	<5	-	< 2	< 2	-	< 2	9	-
	Cadmium	mg/kg	0.4	< 0.4	<1	-	< 0.4	< 0.4	-	< 0.4	<1	-
	Chromium	mg/kg	5	14	14	0	< 5	8	-	< 5	10	-
	Copper	mg/kg	5	< 5	29	-	7	15	73	7	29	122
	Lead	mg/kg	5	18	71	119	15	72	131	15	54	113
	Mercury	mg/kg	0.1	< 0.1	< 0.1	-	< 0.1	< 0.1	-	< 0.1	< 0.1	-
	Nickel	mg/kg	5	< 5	8	-	< 5	9	-	< 5	20	-
	Zinc	mg/kg	5	29	221	154	16	67	123	16	58	114

RPD exceeding criteria

- Primary, Duplicate or Triplicate less than LOR and/or not analysed

Table 1
Tafe - See Street, Meadowbank, NSW
Soil Results & Waste Assessment Criteria
9280-ER-1-1

								Sample ID			TP47-0.0-0.2	TP49_0.0-0.2	TP50_0.0-0.2	TP51_0.0-0.2	TP51_0.8-1.0	TP52_0.0-0.2
								Reference			S19-Jn21935	S19-Jn20055	S19-Jn20056	S19-Jn20057	S19-Jn20058	S19-Jn20059
Group	Analyte	Units	PQL	GSW Criteria CT1	RSW Criteria CT2	GSW Criteria TCLP1 (mg/L)	GSW Criteria SCC1 (mg/kg)	DATASET AVERAGE	DATASET MINIMUM	DATASET MAXIMUM						
Metals	Arsenic	mg/kg	2	100	400	*	500	6.26666667	2.3	12	< 2	3	12	8.5	5.2	7.5
	Cadmium	mg/kg	0.4	20	80	*	100	#DIV/0!	0	0	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium	mg/kg	5	100	400	*	1,900	15.9692308	5.1	29	5.5	16	25	17	10	14
	Copper	mg/kg	5	*	*	*	*	21.2	8.2	36	19	< 5	16	14	33	27
	Lead	mg/kg	5	100	400	*	1,500	57.25	18	110	55	< 5	47	68	40	110
	Lead (leachate)	mg/L	0.02	*	*	5	*	0.03	0.03	0.03	-	-	-	-	-	0.03
	Mercury	mg/kg	0.1	4	16	*	50	0.84285714	0.1	3.1	3.1	< 0.1	0.1	0.2	< 0.1	0.1
	Nickel	mg/kg	5	40	160	*	1,050	9.38333333	5.2	15	< 5	< 5	< 5	5.2	< 5	5.5
	Zinc	mg/kg	5	*	*	*	*	95.075	5.9	170	150	< 5	64	100	74	150
PAHS	Acenaphthylene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benz(a)anthracene	mg/kg	0.5	*	*	*	*	0.7	0.7	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.7
	Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	*	10	0.6	0.5	0.7	< 0.5	< 0.5	< 0.5	0.5	< 0.5	0.7
	Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5	*	*	*	*	0.65	0.5	0.8	< 0.5	< 0.5	< 0.5	0.5	< 0.5	0.8
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5	*	*	*	*	0.66153846	0.6	1.1	0.6	0.6	0.6	0.9	0.6	1.1
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	*	*	*	*	1.21538462	1.2	1.4	1.2	1.2	1.2	1.2	1.2	1.4
	Benzo(b&j)fluoranthene	mg/kg	0.5	*	*	*	*	0.5	0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
	Benzo(g,h,i)perylene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	*	*	*	*	0.7	0.7	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.7
	Dibenz(a,h)anthracene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	*	*	*	*	1.3	0.8	1.9	< 0.5	< 0.5	< 0.5	1.2	< 0.5	1.9
	Fluorene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	*	*	*	*	0.73333333	0.5	1	< 0.5	< 0.5	< 0.5	0.7	< 0.5	1
	Pyrene	mg/kg	0.5	*	*	*	*	1.1	0.8	1.5	< 0.5	< 0.5	< 0.5	1.1	< 0.5	1.5
	Total PAH*	mg/kg	0.5	200	800	N/A	200	3.725	1.6	7	< 0.5	< 0.5	< 0.5	3.5	< 0.5	7
TRH/BTEX	TRH C ₆ - C ₉	mg/kg	20	650	2,600	N/A	650	#DIV/0!	0	0	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C ₁₀ -C ₃₆	mg/kg	50	10,000	40,000	N/A	10,000	129	60	215	< 50	< 50	60	< 50	< 50	< 50
	Benzene	mg/kg	0.1	10	40	*	18	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1	600	2,400	*	1,080	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	m&p-Xylenes	mg/kg	0.2	*	*	*	*	#DIV/0!	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	o-Xylene	mg/kg	0.1	*	*	*	*	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1	288	1,152	*	518	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3	1,000	4,000	*	1,800	#DIV/0!	0	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Asbestos	Asbestos ID			Detection	Detection	*	Detection				Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Concentration exceeding General Solid Waste Criteria CT1 (NSW EPA Waste Classification Guidelines)

Concentration exceeding Restricted Solid Waste Criteria CT2 (NSW EPA Waste Classification Guidelines)

Concentration exceeding General Solid Waste Criteria TCLP1 (mg/L) (NSW EPA Waste Classification Guidelines)

Concentration exceeding General Solid Waste Criteria SCC1 (mg/kg) (NSW EPA Waste Classification Guidelines)

*

= No currently available criterion

-

= No sample analysed

Table 1
Tafe - See Street, Meadowbank, NSW
Soil Results & Waste Assessment Criteria
9280-ER-1-1

								Sample ID			TP52_1.2-1.4	TP53_0.9-1.1	TP54_0.0-0.2	TP54_1.3-1.5	TP55-0.0-0.2	TP56-0.1-0.4	TP57_0.0-0.2
								Reference			S19-Jn20060	S19-Jn20061	S19-Jn20062	S19-Jn20063	S19-Jn21936	S19-Jn21937	S19-Jn20064
Group	Analyte	Units	PQL	GSW Criteria CT1	RSW Criteria CT2	GSW Criteria TCLP1 (mg/L)	GSW Criteria SCC1 (mg/kg)	DATASET AVERAGE	DATASET MINIMUM	DATASET MAXIMUM							
Metals	Arsenic	mg/kg	2	100	400	*	500	6.26666667	2.3	12	11	9	3.6	6.1	2.3	3.1	3.9
	Cadmium	mg/kg	0.4	20	80	*	100	#DIV/0!	0	0	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
	Chromium	mg/kg	5	100	400	*	1,900	15.9692308	5.1	29	29	16	15	17	24	5.1	14
	Copper	mg/kg	5	*	*	*	*	21.2	8.2	36	8.2	35	36	14	18	13	< 5
	Lead	mg/kg	5	100	400	*	1,500	57.25	18	110	21	91	67	28	48	94	18
	Lead (leachate)	mg/L	0.02	*	*	5	*	0.03	0.03	0.03	-	-	-	-	-	-	-
	Mercury	mg/kg	0.1	4	16	*	50	0.84285714	0.1	3.1	< 0.1	0.2	< 0.1	< 0.1	2.1	0.1	< 0.1
	Nickel	mg/kg	5	40	160	*	1,050	9.38333333	5.2	15	< 5	12	8.7	9.9	15	< 5	< 5
	Zinc	mg/kg	5	*	*	*	*	95.075	5.9	170	5.9	150	170	28	110	110	29
PAHS	Acenaphthylene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Acenaphthene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Anthracene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benz(a)anthracene	mg/kg	0.5	*	*	*	*	0.7	0.7	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene	mg/kg	0.5	0.8	3.2	*	10	0.6	0.5	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene TEQ (lower bound) *	mg/kg	0.5	*	*	*	*	0.65	0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(a)pyrene TEQ (medium bound) *	mg/kg	0.5	*	*	*	*	0.66153846	0.6	1.1	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Benzo(a)pyrene TEQ (upper bound) *	mg/kg	0.5	*	*	*	*	1.21538462	1.2	1.4	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
	Benzo(g,h,i)perylene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Benzo(k)fluoranthene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Chrysene	mg/kg	0.5	*	*	*	*	0.7	0.7	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Dibenz(a,h)anthracene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Fluoranthene	mg/kg	0.5	*	*	*	*	1.3	0.8	1.9	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	1.3
	Fluorene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Indeno(1.2.3-cd)pyrene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Naphthalene	mg/kg	0.5	*	*	*	*	#DIV/0!	0	0	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
	Phenanthrene	mg/kg	0.5	*	*	*	*	0.73333333	0.5	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5
	Pyrene	mg/kg	0.5	*	*	*	*	1.1	0.8	1.5	< 0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	1
	Total PAH*	mg/kg	0.5	200	800	N/A	200	3.725	1.6	7	< 0.5	1.6	< 0.5	< 0.5	< 0.5	< 0.5	2.8
TRH/BTEX	TRH C ₆ - C ₉	mg/kg	20	650	2,600	N/A	650	#DIV/0!	0	0	< 20	< 20	< 20	< 20	< 20	< 20	< 20
	TRH C ₁₀ -C ₃₆	mg/kg	50	10,000	40,000	N/A	10,000	129	60	215	< 50	< 50	215	130	< 50	121	119
	Benzene	mg/kg	0.1	10	40	*	18	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Ethylbenzene	mg/kg	0.1	600	2,400	*	1,080	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	m&p-Xylenes	mg/kg	0.2	*	*	*	*	#DIV/0!	0	0	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
	o-Xylene	mg/kg	0.1	*	*	*	*	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Toluene	mg/kg	0.1	288	1,152	*	518	#DIV/0!	0	0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Xylenes - Total	mg/kg	0.3	1,000	4,000	*	1,800	#DIV/0!	0	0	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Asbestos	Asbestos ID			Detection	Detection	*	Detection				Not Detected	Chrysotile, Amosite and Crocidolite Asbestos Detected	Not Detected	Not Detected	Not Detected	Not Detected	Chrysotile Asbestos Detected

Concentration exceeding General Solid Waste Criteria CT1 (NSW EPA Waste Classification Guidelines)

Concentration exceeding Restricted Solid Waste Criteria CT2 (NSW EPA Waste Classification Guidelines)

Concentration exceeding General Solid Waste Criteria TCLP1 (mg/L) (NSW EPA Waste Classification Guidelines)

Concentration exceeding General Solid Waste Criteria SCC1 (mg/kg) (NSW EPA Waste Classification Guidelines)

* =

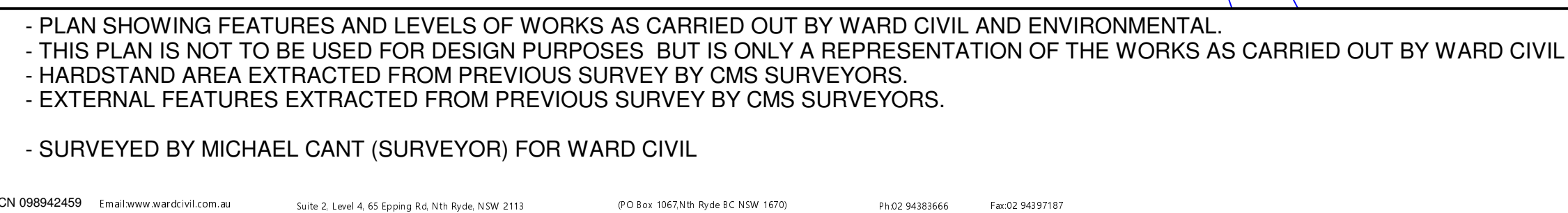
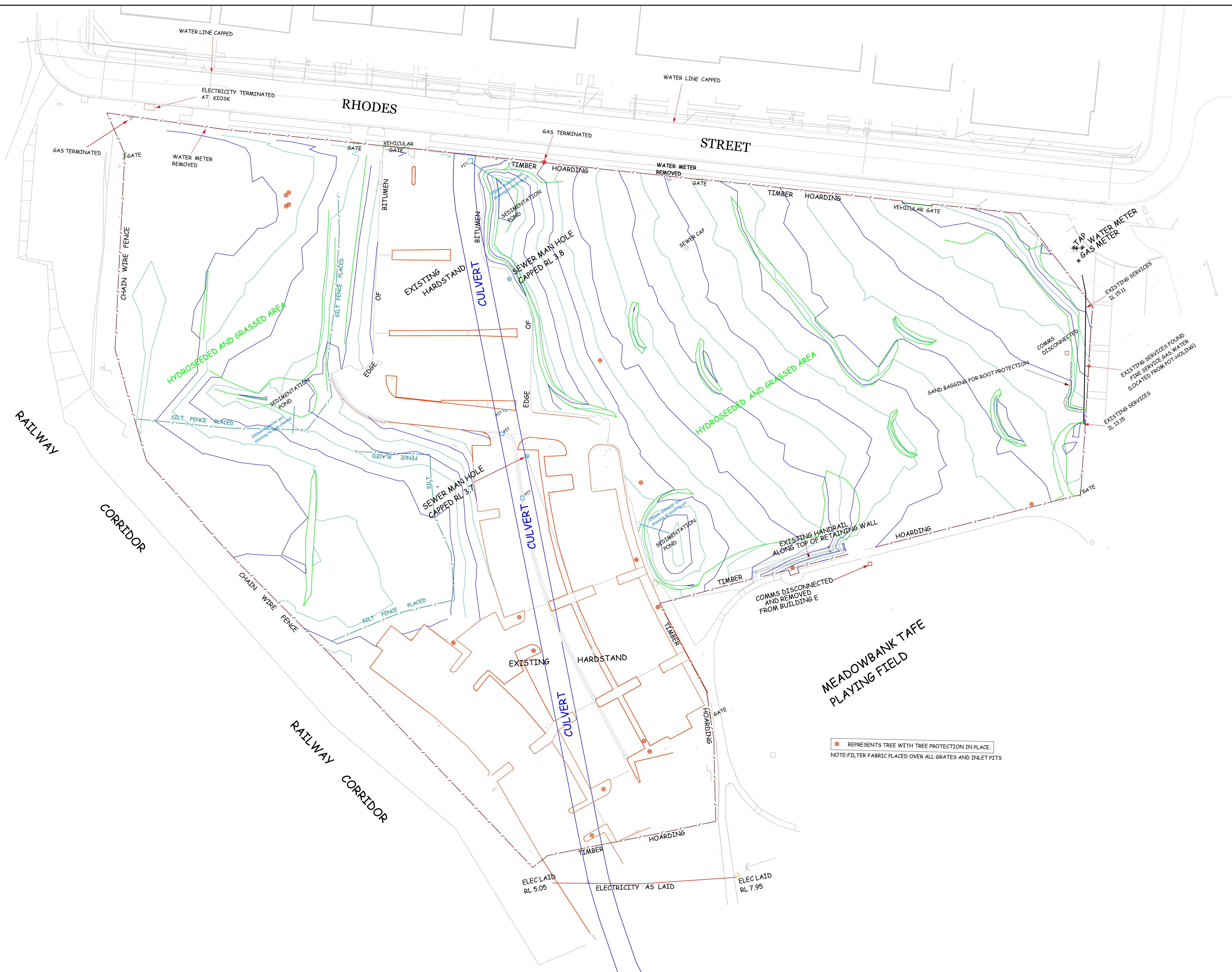
No currently available criterion

- =

No sample analysed

APPENDIX A

SITE SURVEY



Project MEADOWBANK EDUCATIONAL PRECINCT			Drawing Title WORK AS EXECUTED FEATURES, LEVELS AND CONTOURS		
Datum AHD	Date 19/8/19	Scale 1:500 @A1	Dwg No. 695004	Rev C	

APPENDIX B

BOREHOLE LOGS



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Mechanical Pushtube		Hole Location: Refer to figure 4		Driller: Sam Scully		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
PT			0.5			FILL: SAND, brown, medium grained, loose, moist.	BH02A - 0.0-0.3m (PID = 2.3)	M	No potential ACM, odours or staining noted.
			1.0			Borehole BH02A terminated at 0.5m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Mechanical Pushtube		Hole Location: Refer to figure 4		Driller: Sam Scully		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
PT			0.5			FILL: SAND, brown, medium grained, loose, moist.	BH02B - 0.0-0.3m (PID = 1.8)	M	No potential ACM, odours or staining noted.
			1.0			Borehole BH02B terminated at 0.5m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Mechanical Pushtube		Hole Location: Refer to figure 4		Driller: Sam Scully		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
PT			0.5			FILL: SAND, brown, medium grained, loose, moist.	BH02C - 0.0-0.3m (PID = 2.1)	M	No potential ACM, odours or staining noted.
			1.0			Borehole BH02C terminated at 0.5m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Mechanical Pushtube		Hole Location: Refer to figure 4		Driller: Sam Scully		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
PT			0.5			FILL: SAND, brown, medium grained, loose, moist.	BH02D - 0.0-0.3m (PID = 2.0)	M	No potential ACM, odours or staining noted.
						Borehole BH02D terminated at 0.5m			



Borehole Log

Client: Ward Civil						Started: 20/6/19				
Project: Supplementary Contamination Assessment						Finished: 20/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Truck Mounted SFA		Hole Location: Refer to figure 4			Driller: AG		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
SFA						ASPHALT				
						FILL: Gravelly CLAY, brown, soft, moist.	<div>BH40A - 0.1-0.3m</div>	M		No potential ACM, odours or staining noted.
			0.5							
						FILL: CLAY, pale grey, friable, dry with concrete boulders.	<div>BH40A - 0.8-1.0m</div>	D		
			1.0							
					CL	CLAY w/ trace gravels, brown, soft, moist.	<div>BH40A - 1.2-1.4m</div>	M		No potential ACM, odours or staining noted.
			1.5							
			2.0			Borehole BH40A terminated at 2m				



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Job No: 9280

Checked: AR










Borehole Log

Client: Ward Civil						Started: 18/6/19			
Project: Supplementary Contamination Assessment						Finished: 18/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Truck Mounted SFA		Hole Location: Refer to figure 4		Driller: AG		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
SFA						ASPHALT / ROADBASE			
						FILL: Gravelly CLAY w/ some sand, red/grey, soft, moist with concrete and bitumen gravels, with further boulders and bricks at depth.	BH40C - 0.1-0.3m	M	Potential ACM observed. No odours or staining noted.
			0.5						
			1.0				BH40C - 0.9-1.1m		
			1.5						
			2.0				BH40C - 1.7-1.9m		
						Borehole BH40C terminated at 2m			



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Truck Mounted SFA		Hole Location: Refer to figure 4		Driller: AG		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
SFA			0.5			FILL: Clayey SAND, brown, medium grained, loost, moist, with concrete and aggregate gravels to cobbles, sandstones gravels to boulders, wood and steel bar.	 BH40D - 0.0-0.2m	M		No potential ACM, odours or staining noted.
			1.0			FILL: Sandy CLAY, brown, soft, moist, with concrete and aggregate gravels to cobbles, sandstones gravels to boulders, wood and steel bar.	 BH40D - 0.9-1.1m	M		No potential ACM, odours or staining noted.
			1.5				 BH40D - 1.7-1.9m			
			2.0			Borehole BH40D terminated at 2m				



Borehole Log

Client: Ward Civil						Started: 20/6/19				
Project: Supplementary Contamination Assessment						Finished: 20/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Truck Mounted SFA		Hole Location: Refer to figure 4			Driller: AG		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
SFA						ASPHALT				
						FILL: CLAY w/ trace gravels, red/grey/brown, soft, moist.	BH41A - 0.1-0.3m	M		No potential ACM, odours or staining noted.
			0.5							
			1.0				BH41A - 0.9-1.1m			
			1.5							
			2.0			Borehole BH41A terminated at 2m				



Job No: 9280

Borehole Log

Borehole Size:

Checked: AR

BOREHOLE / TEST PIT 9280-ER-1-1-LOGS.GPJ GINT STD AUSTRALIA.GDT 2/7/19


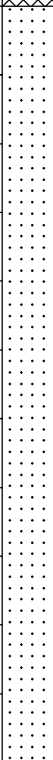


Borehole Log

Client: Ward Civil						Started: 20/6/19				
Project: Supplementary Contamination Assessment						Finished: 20/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Truck Mounted SFA		Hole Location: Refer to figure 4			Driller: AG		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
SFA			0.5			ASPHALT				No potential ACM, odours or staining noted.
						FILL: CLAY w/ trace gravels, red/grey, soft, dry.	BH41C - 0.1-0.3m	D		
			1.0			FILL: Brown.	BH41C - 0.9-1.1m	D		
			1.5							
			2.0			FILL: Red/grey.	BH41C - 1.8-2.0m	D		
						Borehole BH41C terminated at 2m				



Borehole Log

Client: Ward Civil						Started: 20/6/19				
Project: Supplementary Contamination Assessment						Finished: 20/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Truck Mounted SFA		Hole Location: Refer to figure 4		Driller: AG		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
SFA			0.5			FILL: Silty CLAY, brown, soft, dry with trace concrete and brick gravels.	BH41D - 0.0-0.2m	D		No potential ACM, odours or staining noted.
			1.0		SS	Weathered SANDSTONE, red/grey, fine to medium grained, medium dense, dry.	BH41D - 0.9-1.1m	D		No potential ACM, odours or staining noted.
			1.5							
			2.0				BH41D - 1.8-2.0m			
						Borehole BH41D terminated at 2m				



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly SAND, dark brown/grey, medium grained, loose, moist with brick, concrete and sandstone gravels.	SS02A - 0.0-0.3m	M	No potential ACM, odours or staining noted.
							SS02A - 0.7-1.0m		
			1.0			Borehole SS02A terminated at 1m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, brown, fine to medium grained, loose, moist with sandstone gravels to boulders.	SS02B - 0.0-0.3m	M	Refusal at 0.7m (sandstone). No potential ACM, odours or staining noted.
			1.0			Borehole SS02B terminated at 0.7m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, brown, fine to medium grained, loose, moist with concrete and sandstone gravels to boulders.	SS02C - 0.0-0.3m	M	Refusal at 0.6m (sandstone). No potential ACM, odours or staining noted.
			1.0			Borehole SS02C terminated at 0.6m			
			1.5						
			2.0						





Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator						FILL: Gravelly SAND, dark brown/grey, medium grained, loose, moist with brick, concrete and sandstone gravels.		M	No potential ACM, odours or staining noted.
							SS02D - 0.0-0.3m		
							SS02D - 0.7-1.0m		
			1.0			Borehole SS02D terminated at 1m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 18/6/19					
Project: Supplementary Contamination Assessment						Finished: 18/6/19					
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:					
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS					
RL Surface:		Contractor:		Bearing: ---		Checked: AR					
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations	
Excavator						FILL: Clayey SAND, brown, medium grained, soft, moist with brick, concrete and sandstone gravels and boulders.	 SS03A - 0.0-0.2m	M		No potential ACM, odours or staining noted.	
			0.5								
						FILL: COALWASH / ASH gravels, black, moist with sandstone gravels and boulders.	 SS03A - 0.5-0.7m	M		No potential ACM, odours or staining noted.	





Borehole Log

Client: Ward Civil						Started: 18/6/19			
Project: Supplementary Contamination Assessment						Finished: 18/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, dark brown, soft, moist with aggregate and concrete gravels to boulders, ceramics, glass fragments and ash.	SS03B - 0.0-0.2m	M	No potential ACM, odours or staining noted.
							SS03B - 0.8-1.0m		
			1.0			Borehole SS03B terminated at 1m			
			1.5						
			2.0						





Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Clayey SAND, brown, medium grained, soft, moist with brick, concrete and sandstone gravels and cobbles.	 SS03C - 0.0-0.2m	M		No potential ACM, odours or staining noted.
			1.0			FILL: COALWASH / ASH gravels, black, moist.	 SS03C - 0.5-0.7m	M		No potential ACM, odours or staining noted.
			1.5			Borehole SS03C terminated at 1.1m				
			2.0							



Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with sandstone and concrete gravels, to boulders, and brick.	TP04A - 0.0-0.2m (PID = 0.9)	M		No potential ACM, odours or staining noted.
			1.0		SW-SC	SAND w/ trace clay, grey/yellow, medium dense, medium grained, moist.	TP04A - 0.9-1.1m (PID = 1.1)	M		No potential ACM, odours or staining noted.
			1.5			Borehole TP04A terminated at 1.3m				
			2.0							



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with sandstone and concrete gravels, to boulders, and brick.	TP04B - 0.0-0.2m (PID = 0.1)	M	Refusal at 0.7m (sandstone). Potential ACM observed in-situ. No odours or staining noted.
						Borehole TP04B terminated at 0.7m			
			1.0						
			1.5						
			2.0						




Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with sandstone and concrete gravels, to boulders, and brick.	TP04C - 0.0-0.2m (PID = 0.5)	M	Refusal at 1.0m (sandstone). No potential ACM, odours or staining noted.
							TP04C - 0.8-1.0m (PID = 0.8)		
			1.0			Borehole TP04C terminated at 1m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: Gravelly CLAY w/ some sand, brown/orange/grey, soft, moist with sandstone and concrete gravels to boulders.	TP04D - 0.0-0.2m (PID = 2.3)	M		No potential ACM, odours or staining noted.
			0.5							



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with concrete and sandstone gravels to boulders.	TP07A - 0.1-0.4m	M	Potential ACM observed on site surface. No odours or staining noted.
			1.0			Borehole TP07A terminated at 0.6m			
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with concrete and sandstone gravels to boulders.	TP07B - 0.1-0.4m	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP07B terminated at 0.6m				
			1.5							
			2.0							



Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with concrete and sandstone gravels to boulders.	TP07C - 0.1-0.4m	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP07C terminated at 0.6m				
			1.5							
			2.0							



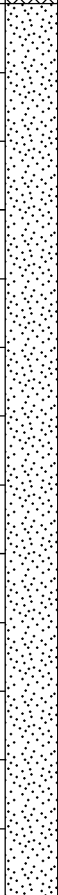




Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY, brown, soft, moist with concrete and sandstone gravels to boulders.	TP07D - 0.1-0.4m	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP07D terminated at 0.6m				
			1.5							
			2.0							



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: Silty SAND w/ clay, brown, medium grained, loose, dry with sandstone gravels, concrete and brick.	 TP16A - 0.0-0.2m (PID = 1.6)	D		No potential ACM, odours or staining noted.
			0.5							
					SP	SAND, brown/orange, medium grained, medium density, moist.	 TP16A - 0.7-0.9m (PID = 2.1)	M		No potential ACM, odours or staining noted.
			1.0							
			1.5				 TP16A - 1.6-1.8m (PID = 1.5)			
			2.0			Borehole TP16A terminated at 2m				






Borehole Log

Client: Ward Civil						Started: 18/6/19			
Project: Supplementary Contamination Assessment						Finished: 18/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Clayey SAND, brown, loose, soft, medium grained, with sandstone gravels to boulders, concrete boulders, tiles, glass and steel.	TP16B - 0.0-0.2m (PID = 0.9)	M	No potential ACM, odours or staining noted.
			1.0				TP16B - 0.9-1.1m (PID = 0.9)		
			1.5				TP16B - 1.8-2.0m (PID = 1.3)		
			2.0				Borehole TP16B terminated at 2m		







Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator						FILL: Clayey SAND, brown, loose, soft, medium grained, with sandstone gravels to boulders, concrete boulders, tiles, glass and steel.	 TP16B - 0.0-0.2m (PID = 2.5)	M		No potential ACM, odours or staining noted.
			0.5							
			1.0							
			1.5							
			2.0			Borehole TP16C terminated at 2m	 TP16B - 1.8-2.0m (PID = 0.3)			





Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator			Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS		
RL Surface:			Contractor:			Bearing: ---		Checked: AR		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator						FILL: Silty SAND w/ clay, brown, medium grained, loose, dry with sandstone and bitumen gravels, concrete and brick.	 TP16D - 0.0-0.2m (PID = 1.0)	D		No potential ACM, odours or staining noted.
			0.5							
					SP	SAND, orange, medium grained, medium density, moist.	 TP16D - 0.7-0.9m (PID = 1.6)	M		No potential ACM, odours or staining noted.
			1.0							
						Borehole TP16D terminated at 1.2m				
			1.5							
			2.0							



Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: SAND w/ trace clay, brown, fine to medium grained, loose, moist with sandstone and concrete gravels to cobbles.	TP22A - 0.0-0.2m (PID = 0.8)	M		No potential ACM, odours or staining noted.
			0.5							
			1.0							
					SP	SAND w/ trace clay, red/grey, medium grained, medium dense, moist.	TP22A - 1.0-1.2m (PID = 0.5)	M		No potential ACM, odours or staining noted. Potentially reworked natural.
			1.5							
						Borehole TP22A terminated at 1.5m				
			2.0							



Borehole Log

Client: Ward Civil					Started: 19/6/19				
Project: Supplementary Contamination Assessment					Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW					Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS		
RL Surface:		Contractor:			Bearing: ---		Checked: AR		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, brown, fine to medium grained, loose, moist with sandstone and concrete gravels to cobbles.	TP22B - 0.0-0.2m (PID = 0.9)	M	No potential ACM, odours or staining noted.
			1.0		SP	SAND w/ trace clay, red/grey, medium grained, medium dense, moist with aggregate gravels.	TP22B - 0.9-1.1m (PID = 0.6)	M	No potential ACM, odours or staining noted.
			1.5			Borehole TP22B terminated at 1.5m			
			2.0						

Borehole Log

Client: Ward Civil

Started: 19/6/19

Project: Supplementary Contamination Assessment

Finished: 19/6/19

Location: Meadowbank Schools Project, See Street, Meadowbank NSW

Borehole Size:

Rig Type: Excavator

Hole Location: Refer to figure 4

Driller: Ken Coles

Logged: SS

RL Surface:

Contractor:

Bearing: ---

Checked: AR

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, brown, fine to medium grained, loose, moist with sandstone and concrete gravels to cobbles.	TP22C - 0.0-0.2m (PID = 0.2)	M	No potential ACM, odours or staining noted.
			1.0						
			1.5				TP22C - 1.1-1.3m (PID = 0.4)		
			2.0			Borehole TP22C terminated at 1.5m			




Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, brown, fine to medium grained, loose, moist with sandstone and concrete gravels to cobbles.	TP22D - 0.0-0.2m (PID = 1.2)	M	No potential ACM, odours or staining noted.
							TP22D - 1.1-1.3m (PID = 0.9)		
			1.5			Borehole TP22D terminated at 1.5m			
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, dark brown, medium dense, medium grained, moist with brick, sandstone, concrete and aggregate gravels to cobbles.	 TP23A - 0.1-0.4m (PID = 0.7)	M	No potential ACM, odours or staining noted.
						Borehole TP23A terminated at 0.5m			
			1.0						
			1.5						
			2.0						




Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, dark brown, medium dense, medium grained, moist with brick, sandstone, concrete and aggregate gravels to cobbles.	TP23B - 0.1-0.4m (PID = 1.3)	M	No potential ACM, odours or staining noted.
			1.0			Borehole TP23B terminated at 0.5m			
			1.5						
			2.0						




Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, dark brown, medium dense, medium grained, moist with brick, sandstone, concrete and aggregate gravels to cobbles.	 TP23C - 0.1-0.4m (PID = 1.2)	M	No potential ACM, odours or staining noted.
						Borehole TP23C terminated at 0.5m			
			1.0						
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, dark brown, medium dense, medium grained, moist with brick, sandstone, concrete and aggregate gravels to cobbles.	 TP23D - 0.1-0.4m (PID = 0.8) / DUP05 / DUP05A	M	No potential ACM, odours or staining noted.
						Borehole TP23D terminated at 0.5m			
			1.0						
			1.5						
			2.0						



Borehole Log

Client: Ward Civil						Started: 18/6/19		
Project: Supplementary Contamination Assessment						Finished: 18/6/19		
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:		
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS		
RL Surface:		Contractor:		Bearing: ---		Checked: AR		

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Clayey SAND, orange/dark brown, medium grained, loose, soft, moist with aggregate gravels, brick and reworked red/grey clay, with ash/coalwash.	 TP24A - 0.1-0.4m (PID = 2.1)	M		No potential ACM, odours or staining noted.
						Borehole TP24A terminated at 0.6m				
			1.0							
			1.5							
			2.0							



Borehole Log

Client: Ward Civil						Started: 18/6/19		
Project: Supplementary Contamination Assessment						Finished: 18/6/19		
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:		
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS		
RL Surface:		Contractor:		Bearing: ---		Checked: AR		

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Sandy CLAY, dark brown, loose, medium grained, soft, moist with lots of ash and some gravels.	<div>TP24B - 0.1-0.4m (PID = 1.7)</div> <div>TP24B - 0.3-0.5m (PID = 1.8)</div>	M		No potential ACM, odours or staining noted.
					CL	CLAY, orange/grey, firm, moist.		M		No potential ACM, odours or staining noted.
						Borehole TP24B terminated at 0.6m				



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Clayey SAND, orange/dark brown, medium grained, loose, soft, moist with aggregate gravels, brick and reworked red/grey clay, with ash/coalwash.	TP24C - 0.1-0.4m (PID = 1.9)	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP24C terminated at 0.6m				
			1.5							
			2.0							



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Clayey SAND, orange/dark brown, medium grained, loose, soft, moist with aggregate gravels, brick and reworked red/grey clay, with ash/coalwash.	TP24D - 0.1-0.4m (PID = 1.9)	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP24D terminated at 0.6m				
			1.5							
			2.0							



Borehole Log

Client: Ward Civil					Started: 18/6/19				
Project: Supplementary Contamination Assessment					Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW					Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS		
RL Surface:		Contractor:			Bearing: ---		Checked: AR		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: CLAY w/ some sand, brown, soft, moist with plastic, wood and sandstone gravels to boulders.	TP30A - 0.0-0.2m / DUP03 / DUP03A	M	No potential ACM, odours or staining noted.
			1.0			FILL: Gravelly CLAY, red/brown, firm, moist with aggregate and concrete gravels.	TP30A - 0.7-0.9m	M	No potential ACM, odours or staining noted.
			1.5			FILL: SAND, yellow/grey, fine grained, very loose, moist.	TP30A - 1.7-1.9m	M	No potential ACM, odours or staining noted.
			2.0			Borehole TP30A terminated at 2m			



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator						FILL: Clayey SAND, brown, fine to medium grained, very loose, moist with bricks, concrete gravels and boulders and steel bar.	TP30B - 0.0-0.2m	M		Potential ACM observed in-situ. No odours or staining noted.
			0.5							
			1.0		TP30B - 0.9-1.1m					
			1.5							
						FILL: SAND, yellow/grey, fine grained, very loose, moist.	TP30B - 1.6-1.8m	M		No potential ACM, odours or staining noted.
			2.0			Borehole TP30B terminated at 2m				



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Sandy CLAY, brown, soft, moist with sandstone gravels to boulders, concrete and aggregate gravels, bitumen, bricks and fibrous cement sheeting fragments.	TP30C - 0.0-0.2m / DUP02 / DUP02A	M		Potential ACM observed in-situ. No odours or staining noted.
			1.0		TP30C - 0.9-1.1m					
			1.5			FILL: SAND, yellow/grey, fine grained, very loose, moist.	TP30C - 1.7-1.9m	M		No potential ACM, odours or staining noted.
		2.0								
						Borehole TP30C terminated at 2m				

Borehole Log

Client: Ward Civil

Started: 19/6/19

Project: Supplementary Contamination Assessment

Finished: 19/6/19

Location: Meadowbank Schools Project, See Street, Meadowbank NSW

Borehole Size:

Rig Type: Excavator

Hole Location: Refer to figure 4

Driller: Ken Coles

Logged: SS

RL Surface:

Contractor:



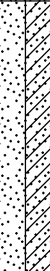

Bearing: ---

Checked: AR

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator						FILL: Sandy CLAY, red/grey, soft, moist with concrete gravels.	TP42 - 0.0-0.2m (PID = 0.4)	M	Potential ACM observed on surface. No odours or staining noted.
			0.5		SP-SC	SAND w/ trace clay, ref w/ grey mottle, medium grained, medium dense, moist.	TP42 - 0.4-0.6m (PID = 0.9)	M	No potential ACM, odours or staining noted.
			1.0			Borehole TP42 terminated at 0.8m			
			1.5						
			2.0						






Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: Sandy CLAY, red/grey, soft, moist with concrete gravels.	 TP43 - 0.0-0.2m (PID = 1.2)	M		No potential ACM, odours or staining noted.
			0.5		SP-SC	SAND w/ trace clay, ref w/ grey mottle, medium grained, medium dense, moist.	 TP43 - 0.5-0.7m (PID = 0.9)	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP43 terminated at 0.9m				
			1.5							
			2.0							



Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: Clayey SAND, red/grey, mefium grained, medium dense, moise with some sandstone gravels to cobbles.	 TP44 - 0.0-0.2m (PID = 1.8)	M		No potential ACM, odours or staining noted. Potentially reworked natural material.
					 TP44 - 0.8-1.0m (PID = 1.1)					
					 TP44 - 1.5-1.7m (PID = 2.1)					
			0.5							
			1.0							
			1.5							
			2.0			Borehole TP44 terminated at 1.7m				



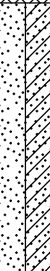



Borehole Log

Client: Ward Civil						Started: 19/6/19			
Project: Supplementary Contamination Assessment						Finished: 19/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY w/ some sand, brown, soft, moist with sandstone and concrete gravels to cobbles and brick.	TP45 - 0.1-0.4m (PID = 1.0)	M	No potential ACM, odours or staining noted.
						Borehole TP45 terminated at 0.5m			



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: Gravelly SAND w/ trace clay, dark brown, medium grained, loose, moist with aggregate gravels and wood.	 TP46 - 0.0-0.2m (PID = 0.4)	M		No potential ACM, odours or staining noted.
			0.5		SP-SC	SAND w/ trace clay, red/yellow, medium grained, loose, moist.	 TP46 - 0.5-0.7m (PID = 0.9)	M		No potential ACM, odours or staining noted.
			1.0			Borehole TP46 terminated at 0.9m				
			1.5							
			2.0							



Job No: 9280

Borehole Log

Borehole Size:

Checked: AR

BOREHOLE / TEST PIT 9280-ER-1-1-LOGS.GPJ GINT STD AUSTRALIA.GDT 2/7/19





Borehole Log

Client: Ward Civil						Started: 18/6/19			
Project: Supplementary Contamination Assessment						Finished: 18/6/19			
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:			
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:		Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition Consistency/Density Index	Additional Observations
Excavator					SP-SC	SAND w/ trace clay, red/yellow, medium grained, loose, moist.	TP49 - 0.0-0.2m (PID = 0.8)	M	No potential ACM, odours or staining noted.
			0.5			Borehole TP49 terminated at 0.4m			
			1.0						
			1.5						
			2.0						




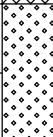



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator						FILL: Silty CLAY, brown, soft, moist with concrete gravels.	TP50 - 0.0-0.2m (PID = 1.5)	M		No potential ACM, odours or staining noted.
					SP-SC	SAND w/ trace clay, red/yellow, medium grained, loose, moist.	TP50 - 0.2-0.4m (PID = 1.8)	M		No potential ACM, odours or staining noted.
			0.5							
						Borehole TP50 terminated at 0.6m				
			1.0							
			1.5							
			2.0							





Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator						FILL: Gravelly SAND w/ trace clay, brown/grey, medium grained, soft, moist with sandstone and concrete gravels to cobbles and brick.	 TP51 - 0.0-0.2m (PID = 1.1)	M		No potential ACM, odours or staining noted.
					 TP51 - 0.8-1.0m (PID = 1.3)					
			0.5							
			1.0							
					SW	SAND, yellow/pale brown, fine to medium grained, very loose, moist.	 TP51 - 1.3-1.5m (PID = 0.8)	M		No potential ACM, odours or staining noted.
			1.5							
			2.0			Borehole TP51 terminated at 1.5m				



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator						FILL: Sandy CLAY, brown, soft, moist with glass, brick, concrete gravels and boulders and steel bar.	TP52 - 0.0-0.2m (PID = 0.5)	M		No potential ACM, odours or staining noted.
			0.5							
			1.0							
					CL	CLAY, red/grey, firm, moist.	TP52 - 0.9-1.1m (PID = 0.6)	M		No potential ACM, odours or staining noted.
			1.5			TP52 - 1.2-1.4m (PID = 0.8)				
						Borehole TP52 terminated at 1.5m				
			2.0							



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Gravelly CLAY w/ sand, brown/grey, soft, moist with sandstone gravels to cobbles and brick.	TP53 - 0.0-0.2m (PID = 0.5)	M		No potential ACM, odours or staining noted.
			1.0		TP53 - 0.9-1.1m (PID = 0.9)					
			1.5		TP53 - 1.2-1.4m (PID = 0.1)					
			2.0			Borehole TP53 terminated at 1.5m				



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS			
RL Surface:		Contractor:			Bearing: ---		Checked: AR			
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SILT, pale brown, very loose, soft, moist with sandstone cobbles and boulders and wood.	TP54 - 0.0-0.2m (PID = 0.7) / DUP01 / DUP01A	M		No potential ACM, odours or staining noted.
			1.0			FILL: Gravelly CLAY, grey/brown, soft, moist with concrete and aggregate gravel, bitumen cobbles to boulders and sandstone cobbles to boulders.	TP54 - 0.6-0.8m (PID = 0.4)	M		No potential ACM, odours or staining noted.
			1.5			Borehole TP54 terminated at 1.5m	TP54 - 1.3-1.5m (PID = 0.2)			
			2.0							




Borehole Log

Client: Ward Civil						Started: 19/6/19				
Project: Supplementary Contamination Assessment						Finished: 19/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator			Hole Location: Refer to figure 4			Driller: Ken Coles		Logged: SS		
RL Surface:			Contractor:			Bearing: ---		Checked: AR		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Clayey SAND, brown, medium grained, medium dense, moist with sandstone and concrete gravels to cobbles.	TP55 - 0.0-0.2m (PID = 0.3)	M		No potential ACM, odours or staining noted.
			1.0			FILL: SAND w/ trace clay, grey/orange, medium grained, medium dense, moist with trace aggregate gravels and bricks.	TP55 - 0.8-1.0m (PID = 0.1)	M		No potential ACM, odours or staining noted.
			1.5			Borehole TP55 terminated at 1.5m				
			2.0							


Borehole Log

Client: Ward Civil						Started: 19/6/19		
Project: Supplementary Contamination Assessment						Finished: 19/6/19		
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:		
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS		
RL Surface:		Contractor:		Bearing: ---		Checked: AR		

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/Density Index	Additional Observations
Excavator			0.5			FILL: SAND w/ trace clay, dark brown, medium grained, medium dense, moist with brick, sandstone, concrete and aggregate gravels to cobbles.	TP56 - 0.1-0.4m (PID = 1.9)	M		No potential ACM, odours or staining noted.
						Borehole TP56 terminated at 0.5m				



Borehole Log

Client: Ward Civil						Started: 18/6/19				
Project: Supplementary Contamination Assessment						Finished: 18/6/19				
Location: Meadowbank Schools Project, See Street, Meadowbank NSW						Borehole Size:				
Rig Type: Excavator		Hole Location: Refer to figure 4		Driller: Ken Coles		Logged: SS				
RL Surface:		Contractor:		Bearing: ---		Checked: AR				
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
Excavator			0.5			FILL: Sandy CLAY, orange/dark brown, medium grained, loose, soft, moist with brick, sandstone, concrete and aggregate gravels.	TP57 - 0.0-0.2m (PID = 1.1) / DUP01 / DUP01A	M		No potential ACM, odours or staining noted.
			1.0				TP57 - 0.8-1.0m (PID = 1.5)			
			1.5			Borehole TP57 terminated at 1m				
			2.0							

APPENDIX C

CALIBRATION CERTIFICATES

Calibration & Service Report Gas Monitor

Company: Active Environmental Solutions Hire
Contact: Aleks Todorovic
Address: 2 Merchant Avenue
Thomastown Vic 3074
Phone: 03 9464 2300 | **Fax:** 03 9464 3421
Email: Hire@aesolutions.com.au

Manufacturer: RAE Systems
Instrument: MiniRAE 3000
Model: PGM 7320
Configuration: VOC
Wireless: -
Network ID: -
Unit ID: -

Serial #: 592-914571
Asset #: -
Part #: -
Sold: -
Last Cal: -
Job #: -
Cal Spec: Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen		-	
LEL		-	
PID	10.6eV	✓	
Toxic 1		-	
Toxic 2		-	
Toxic 3		-	
Toxic 4		-	
Toxic 5		-	

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	2R000773	Isobutylene	100 PPM	2440-3-1	1	0	100 PPM
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: Milenko Sasic

Date: 04/06/2019

Next due: 04/12/2019

Head Office – Melbourne
2 Merchant Avenue
Thomastown VIC 3074 Australia
T: +61 3 9464 2300

NSW Office – Ashfield
Level 2, Suite 14, 6 - 8 Holden Street
Ashfield NSW 2131 Australia
T: +61 2 9716 5966

WA Office – Malaga
Unit 6, 41 Holder Way
Malaga WA 6090 Australia
T: +61 8 9249 5663

QLD Office – Banyo
Unit 17, 23 Ashtan Place
Banyo QLD 4014 Australia
T: +61 7 3267 1433

sales@aesolutions.com.au



www.aesolutions.com.au

APPENDIX D

NATA ACCREDITED LABORATORY DOCUMENTATION

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: ALL SRAS/RESULTS/INVOICES

Report 662967-S
Project name ADDITIONAL - MEADOWBANK
Project ID 9280
Received Date Jun 27, 2019

Client Sample ID			TP22A-0.0-0.2	TP22A-1.0-1.2	TP22B-0.0-0.2	TP22B-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn32732	S19-Jn32733	S19-Jn32734	S19-Jn32735
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	43	7.3	290	150
% Moisture	1	%	12	11	14	11

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
Heavy Metals	Sydney	Jun 27, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jun 27, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: ADDITIONAL - MEADOWBANK
Project ID: 9280

Order No.:
Report #: 662967
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 27, 2019 11:30 AM
Due: Jun 28, 2019
Priority: Overnight
Contact Name: ALL SRAS/RESULTS/INVOICES

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Lead	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	TP22A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn32732	X	X
2	TP22A-1.0-1.2	Jun 19, 2019		Soil	S19-Jn32733	X	X
3	TP22B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn32734	X	X
4	TP22B-0.9-1.1	Jun 19, 2019		Soil	S19-Jn32735	X	X
Test Counts						4	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank										
Heavy Metals										
Lead				mg/kg	< 5			5	Pass	
LCS - % Recovery										
Heavy Metals										
Lead				%	102			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Heavy Metals										
Lead					Result 1					
Lead				%	127			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1				Acceptance Limits	Pass Limits	Qualifying Code
Duplicate										
Heavy Metals										
Lead					Result 1	Result 2	RPD			
Lead				mg/kg	19	16	20	30%	Pass	
Duplicate										
					Result 1	Result 2	RPD			
% Moisture				%	11	11	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

Authorised By

Andrew Black Analytical Services Manager
Gabriele Cordero Senior Analyst-Metal (NSW)



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Enviro Sample NSW

To: Andrew Black
Subject: RE: OVERNIGHT TAT ADDITIONAL ANALYSIS: FW: Eurofins | mgt Test Results, Invoice - Report 661620 : Site MEADOWBANK (9280)

From: enviro [<mailto:enviro@allgeo.com.au>]
Sent: Thursday, 27 June 2019 11:30 AM
To: Andrew Black
Subject: RE: Eurofins | mgt Test Results, Invoice - Report 661620 : Site MEADOWBANK (9280)

EXTERNAL EMAIL*

Thanks,

Could we please request lead analysis on soil samples:

- TP221-0.0-0.2;
- TP22A-1.0-1.2;
- TP22B-0.0-0.2;
- TP22B-0.9-1.1.

Please place analysis on fastest possible TAT.

Please do not hesitate to contact me if you have any queries or questions,

Kind Regards,

Sam Scully

Environmental Consultant - 0400 339 745 | Email: sam@allgeo.com.au

 Alliance Geotechnical ENGINEERING ENVIRONMENTAL TESTING Your On-Site Geotechnical & Environmental Specialists	 OH&S QUALITY ENVIRONMENT OH&S
Office Email: admin@allgeo.com.au - Website: allgeo.com.au - Office Phone: 1800 288 188 Postal Address: PO Box 275, Seven Hills NSW 1730 / Office & Laboratory Address: 10 Welder Road, Seven Hills NSW 2147	

From: AndrewBlack@eurofins.com <AndrewBlack@eurofins.com>
Sent: Wednesday, 26 June 2019 6:37 PM
To: Aidan Rooney <aidan@allgeo.com.au>
Cc: enviro <enviro@allgeo.com.au>; admin <admin@allgeo.com.au>
Subject: Eurofins | mgt Test Results, Invoice - Report 661620 : Site MEADOWBANK (9280)

Regards

Andrew Black
Analytical Services Manager

Eurofins | mgt

Unit 7

7 Friesian Close

SANDGATE NSW 2304

AUSTRALIA

Phone: +61 299 008 490

Mobile: +61 410 220 750

Email: AndrewBlack@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1079 - PFAS Fingerprinting](#)

[EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations](#)

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Aidan Rooney
Report 661908-AID
Project Name MEADOWBANK
Project ID 9280
Received Date Jun 20, 2019
Date Reported Jun 27, 2019

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name MEADOWBANK
Project ID 9280
Date Sampled Jun 20, 2019
Report 661908-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
BH40A-0.1-0.3	19-Jn24200	Jun 20, 2019	Approximate Sample 641g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH40A-0.8-1.0	19-Jn24201	Jun 20, 2019	Approximate Sample 583g Sample consisted of: Grey fine-grained sandy soil and sandstone	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH40B-0.1-0.3	19-Jn24202	Jun 20, 2019	Approximate Sample 622g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH40B-0.8-1.0	19-Jn24203	Jun 20, 2019	Approximate Sample 562g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41A-0.1-0.3	19-Jn24204	Jun 20, 2019	Approximate Sample 609g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41A-0.9-1.1	19-Jn24205	Jun 20, 2019	Approximate Sample 556g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41B-0.0-0.2	19-Jn24206	Jun 20, 2019	Approximate Sample 467g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41B-0.8-1.0	19-Jn24207	Jun 20, 2019	Approximate Sample 465g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
BH41C-0.1-0.3	19-Jn24208	Jun 20, 2019	Approximate Sample 533g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41C-0.9-1.1	19-Jn24209	Jun 20, 2019	Approximate Sample 554g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41D-0.0-0.2	19-Jn24210	Jun 20, 2019	Approximate Sample 490g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH41D-0.9-1.1	19-Jn24211	Jun 20, 2019	Approximate Sample 696g Sample consisted of: Brown fine-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 20, 2019	Indefinite

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661908
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 20, 2019 5:10 PM
Due: Jun 27, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
1	BH40A-0.1-0.3	Jun 20, 2019		Soil	S19-Jn24200	X	
2	BH40A-0.8-1.0	Jun 20, 2019		Soil	S19-Jn24201	X	
3	BH40B-0.1-0.3	Jun 20, 2019		Soil	S19-Jn24202	X	
4	BH40B-0.8-1.0	Jun 20, 2019		Soil	S19-Jn24203	X	
5	BH41A-0.1-0.3	Jun 20, 2019		Soil	S19-Jn24204	X	
6	BH41A-0.9-1.1	Jun 20, 2019		Soil	S19-Jn24205	X	
7	BH41B-0.0-0.2	Jun 20, 2019		Soil	S19-Jn24206	X	
8	BH41B-0.8-1.0	Jun 20, 2019		Soil	S19-Jn24207	X	
9	BH41C-0.1-0.3	Jun 20, 2019		Soil	S19-Jn24208	X	

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661908
Phone: 1800 288 188
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Received: Jun 20, 2019 5:10 PM
Due: Jun 27, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	HOLD
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
10	BH41C-0.9-1.1	Jun 20, 2019		Soil	S19-Jn24209	X	
11	BH41D-0.0-0.2	Jun 20, 2019		Soil	S19-Jn24210	X	
12	BH41D-0.9-1.1	Jun 20, 2019		Soil	S19-Jn24211	X	
13	BH40A-1.2-1.4	Jun 20, 2019		Soil	S19-Jn24212		X
14	BH40B-1.4-1.6	Jun 20, 2019		Soil	S19-Jn24213		X
15	BH41A-1.8-2.0	Jun 20, 2019		Soil	S19-Jn24214		X
16	BH41B-1.4-1.6	Jun 20, 2019		Soil	S19-Jn24215		X
17	BH41C-1.8-2.0	Jun 20, 2019		Soil	S19-Jn24216		X
18	BH41D-1.8-2.0	Jun 20, 2019		Soil	S19-Jn24217		X
Test Counts						12	6

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

S19-Jn24206, S19-Jn24207, S19-Jn24210: Samples received were less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

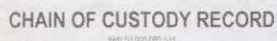
Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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• **Sydney Laboratory**
120 Pitt St F 10, Pitt St, East Cove West, NSW 2050
(02) 9939 5400 Email: Sydney@sydney.com.au

• **Brisbane Laboratory**
Unit 1, 21 Somerville Pl, Maroochydore, QLD 4572
Tel 5540 4500 • Enquiries@bce.co.uk

- **Perth Laboratory**
Unit 2/11 Leach Highway, Perth, WA 6100
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- **Melbourne Laboratory**
2 Kingston Town Close, Cokkigh, VIC 3115
(03) 9544 5000. Enquiries@melb.csl.vic.gov.au

Company		ALLIANCE GEOTECHNICAL		Project No		9280		Project Manager		Aiden Rooney		Sampler(s)		Sam Scully	
Address		10 WELDER ROAD, SEVEN HILLS NSW		Project Name		Meadowbank		EDD Format (ESdat, EQuIS, Custom)				Handed over by			
Contact Name		Sam Scully		Analyse								Email for Invoice		admin@allgeo.com.au	
Phone No		400339745		(Note: Where mobile no requested please specify "ring or *Home") (S)ITE								Email for Results		sam@allgeo.com.au	
Special Directions				lead											
Purchase Order				BTEX		PAH		8 Metals		VOCs		OCP		PCB	
Quote ID No				Phenols		Asbestos (0.001%)									
No	Client Sample ID	Sampled Date/Time (dd/mm/yyyy hh:mm)	Matrix (Solids (S) Water (W))												
1	BH40A-0.1-0.3	206/19	Soil					X							
2	BH40A-0.8-1.0							X							
3	BH40A-1.2-1.4														
4	BH40B-0.1-0.3							X							
5	BH40B-0.8-1.0							X							
6	BH40B-1.4-1.6														
7	BH41A-0.1-0.3							X							
8	BH41A-0.9-1.1							X							
9	BH41A-1.8-2.0														
10	BH41B-0.0-0.2							X							
	BH41B-0.8-1.0							X							
	BH41B-1.4-1.6														
	BH41C-0.1-0.3							X							
	BH41C-0.9-1.1							X							
	BH41C-1.8-2.0														
	BH41D-0.0-0.2							X							
	BH41D-0.9-1.1							X							
	BH41D-1.8-2.0														
Total Counts															
Method of Shipment		X Courier (#) • Hand Delivered • Postal		Name		Sam Scully		Signature		Date		20/06/2019		Time	
Eurofins mgt Laboratory Use Only		Received By Grace Tucker		SYD BNE MEL PER AGL NTL DRW		Signature		Date		20/6/19		Time		5.10	
		Received By		SYD BNE MEL PER AGL NTL DRW		Signature		Date		_/_/_		Time		Report No 66190	

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

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgmt

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Aidan Rooney**

Report **661620-W**
 Project name **MEADOWBANK**
 Project ID **9280**
 Received Date **Jun 19, 2019**

Client Sample ID			TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water
Eurofins mgt Sample No.			S19-Jn21942	S19-Jn21943
Date Sampled			Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	83	< 0.001
Toluene	0.001	mg/L	80	< 0.001
Ethylbenzene	0.001	mg/L	78	< 0.001
m&p-Xylenes	0.002	mg/L	74	< 0.002
o-Xylene	0.001	mg/L	76	< 0.001
Xylenes - Total	0.003	mg/L	75	< 0.003
4-Bromofluorobenzene (surr.)	1	%	113	130

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

BTEX

Testing Site

Sydney

Extracted

Jun 19, 2019

Holding Time

14 Days

- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661620
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 19, 2019 3:20 PM
Due: Jun 26, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	BH02A-0.0-0.3	Jun 19, 2019		Soil	S19-Jn21896				X						X	
2	BH02B-0.0-0.3	Not Provided		Soil	S19-Jn21897				X						X	
3	BH02C-0.0-0.3	Not Provided		Soil	S19-Jn21898				X						X	
4	BH02D-0.0-0.3	Not Provided		Soil	S19-Jn21899				X						X	
5	SS02A-0.0-0.3	Not Provided		Soil	S19-Jn21900	X										
6	SS02B-0.0-0.3	Not Provided		Soil	S19-Jn21901	X										
7	SS02C-0.0-0.3	Not Provided		Soil	S19-Jn21902	X										
8	SS02D-0.0-0.3	Not Provided		Soil	S19-Jn21903	X										
9	TP04A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21904					X					X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TP04A-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21905					X					X	
11	TP04B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21906					X					X	
12	TP04C-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21907					X					X	
13	TP04C-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21908					X					X	
14	TP04D-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21909					X					X	
15	TP04D-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21910					X					X	
16	TP04D-1.5-1.7	Jun 19, 2019		Soil	S19-Jn21911					X					X	
17	TP07A-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21912	X										
18	TP07B-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21913	X										
19	TP07C-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21914	X										
20	TP07D-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21915	X										
21	TP22A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21916									X	X	

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
22	TP22A-1.0-1.2	Jun 19, 2019		Soil	S19-Jn21917									X	X	
23	TP22B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21918									X	X	
24	TP22B-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21919									X	X	
25	TP22C-0.0-0.3	Jun 19, 2019		Soil	S19-Jn21920				X						X	
26	TP22C1.1-1.3	Jun 19, 2019		Soil	S19-Jn21921				X						X	
27	TP22D-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21922				X						X	
28	TP22D-1.1-1.3	Jun 19, 2019		Soil	S19-Jn21923				X						X	
29	TP23A-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21924					X					X	
30	TP23B-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21925					X					X	
31	TP23C-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21926					X					X	
32	TP23D-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21927					X			X		X	
33	TP42-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21928								X	X	X	X

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
34	TP42-0.4-0.6	Jun 19, 2019		Soil	S19-Jn21929								X	X	X	X
35	TP43-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21930								X	X	X	X
36	TP43-0.5-0.1	Jun 19, 2019		Soil	S19-Jn21931								X	X	X	X
37	TP44-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21932								X	X	X	X
38	TP44-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21933								X	X	X	X
39	TP45-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21934	X							X		X	
40	TP47-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21935	X				X	X	X	X	X	X	X
41	TP55-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21936	X				X	X	X	X	X	X	X
42	TP56-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21937	X				X	X	X	X	X	X	X
43	DUP-05	Jun 19, 2019		Soil	S19-Jn21938								X		X	
44	FCS-TP04B	Jun 19, 2019		Building Materials	S19-Jn21939		X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
45	FCS-TP07A	Jun 19, 2019		Building Materials	S19-Jn21940		X									
46	FCS-TP042	Jun 19, 2019		Building Materials	S19-Jn21941		X									
47	TRIP SPIKE	Jun 19, 2019		Water	S19-Jn21942									X		
48	TRIP BLANK	Jun 19, 2019		Water	S19-Jn21943									X		
49	SS02A-0.7-1.0	Jun 19, 2019		Soil	S19-Jn21944			X								
50	SS02D-0.7-1.0	Jun 19, 2019		Soil	S19-Jn21945			X								
51	TP44-1.5-1.7	Jun 19, 2019		Soil	S19-Jn21946			X								
52	TP47-0.4-0.6	Jun 19, 2019		Soil	S19-Jn21947			X								
53	TP55-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21948			X								
54	FCS-TP44	Jun 19, 2019		Building Materials	S19-Jn22224		X									

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Sample Detail	Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Test Counts	12	4	5	8	15	3	3	12	15	35	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
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	
LCS - % Recovery									
BTEX									
Benzene			%	76			70-130	Pass	
Toluene			%	76			70-130	Pass	
Ethylbenzene			%	77			70-130	Pass	
m&p-Xylenes			%	75			70-130	Pass	
o-Xylene			%	78			70-130	Pass	
Xylenes - Total			%	76			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Jn13611	NCP	%	100			70-130	Pass	
Toluene	S19-Jn13611	NCP	%	102			70-130	Pass	
Ethylbenzene	S19-Jn13611	NCP	%	100			70-130	Pass	
m&p-Xylenes	S19-Jn13611	NCP	%	98			70-130	Pass	
o-Xylene	S19-Jn13611	NCP	%	101			70-130	Pass	
Xylenes - Total	S19-Jn13611	NCP	%	99			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Jn23494	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S19-Jn23494	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S19-Jn23494	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S19-Jn23494	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S19-Jn23494	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S19-Jn23494	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
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

Authorised By

Andrew Black Analytical Services Manager



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Aidan Rooney

Report 661620-S
Project name MEADOWBANK
Project ID 9280
Received Date Jun 19, 2019

Client Sample ID			BH02A-0.0-0.3	BH02B-0.0-0.3	BH02C-0.0-0.3	BH02D-0.0-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21896	S19-Jn21897	S19-Jn21898	S19-Jn21899
Date Sampled			Jun 19, 2019	Not Provided	Not Provided	Not Provided
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	5.9	8.2	110	85
% Moisture	1	%	7.3	12	13	18

Client Sample ID			TP04A-0.0-0.2	TP04A-0.9-1.1	TP04B-0.0-0.2	TP04C-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21904	S19-Jn21905	S19-Jn21906	S19-Jn21907
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
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	%	89	105	104	113
p-Terphenyl-d14 (surr.)	1	%	83	105	104	112
% Moisture	1	%	14	20	8.5	9.8

Client Sample ID			TP04C-0.8-1.0	TP04D-0.0-0.2	TP04D-0.9-1.1	TP04D-1.5-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21908	S19-Jn21909	S19-Jn21910	S19-Jn21911
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
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	%	109	111	109	102
p-Terphenyl-d14 (surr.)	1	%	109	112	112	105
% Moisture	1	%	8.3	14	8.4	11

Client Sample ID			TP22A-0.0-0.2	TP22A-1.0-1.2	TP22B-0.0-0.2	TP22B-0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21916	S19-Jn21917	S19-Jn21918	S19-Jn21919
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
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	%	116	121	115	116
% Moisture	1	%	9.5	10	14	11

Client Sample ID			TP22C-0.0-0.3	TP22C1.1-1.3	TP22D-0.0-0.2	TP22D-1.1-1.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21920	S19-Jn21921	S19-Jn21922	S19-Jn21923
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	160	170	130	460
% Moisture	1	%	10	7.5	10	8.7

Client Sample ID			TP23A-0.1-0.4	TP23B-0.1-0.4	TP23C-0.1-0.4	TP23D-0.1-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21924	S19-Jn21925	S19-Jn21926	S19-Jn21927
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
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	%	115	110	110	106
p-Terphenyl-d14 (surr.)	1	%	112	110	109	104
Heavy Metals						
Arsenic	2	mg/kg	-	-	-	< 2
Cadmium	0.4	mg/kg	-	-	-	< 0.4
Chromium	5	mg/kg	-	-	-	< 5
Copper	5	mg/kg	-	-	-	7.0
Lead	5	mg/kg	-	-	-	15
Mercury	0.1	mg/kg	-	-	-	< 0.1
Nickel	5	mg/kg	-	-	-	< 5
Zinc	5	mg/kg	-	-	-	16
% Moisture	1	%	7.3	9.5	8.5	11

Client Sample ID			TP42-0.0-0.2	TP42-0.4-0.6	TP43-0.0-0.2	TP43-0.5-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21928	S19-Jn21929	S19-Jn21930	S19-Jn21931
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
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	31	< 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	1.7	1.6
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	0.9	0.7
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	0.4	0.4
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	1.2	1.1
4-Bromofluorobenzene (surr.)	1	%	108	118	102	113
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.3	3.8	7.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	6.5	31	11	13
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	< 5	7.6	13	< 5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	14	< 5	40	< 5
% Moisture	1	%	9.6	12	13	13

Client Sample ID			TP44-0.0-0.2	TP44-0.8-1.0	TP45-0.1-0.4	TP47-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21932	S19-Jn21933	S19-Jn21934	S19-Jn21935
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
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	-	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	-	< 50

Client Sample ID			TP44-0.0-0.2	TP44-0.8-1.0	TP45-0.1-0.4	TP47-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21932	S19-Jn21933	S19-Jn21934	S19-Jn21935
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	121	103	-	106
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	50	mg/kg	< 50	< 50	-	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	-	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	-	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	-	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	-	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	< 0.5
Total PAH*	0.5	mg/kg	-	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	-	111
p-Terphenyl-d14 (surr.)	1	%	-	-	-	109
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

Client Sample ID			TP44-0.0-0.2	TP44-0.8-1.0	TP45-0.1-0.4	TP47-0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21932	S19-Jn21933	S19-Jn21934	S19-Jn21935
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
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
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.2
Dibutylchloroendate (surr.)	1	%	-	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	120
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
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
Dibutylchloroendate (surr.)	1	%	-	-	-	133
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	120
Heavy Metals						
Arsenic	2	mg/kg	< 2	4.3	4.0	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.6	23	26	5.5
Copper	5	mg/kg	< 5	< 5	25	19
Lead	5	mg/kg	< 5	11	74	55
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.2	3.1
Nickel	5	mg/kg	< 5	< 5	30	< 5
Zinc	5	mg/kg	9.7	7.8	95	150
% Moisture	1	%	11	16	15	14

Client Sample ID			TP55-0.0-0.2	TP56-0.1-0.4	DUP-05
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21936	S19-Jn21937	S19-Jn21938
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	54	-
TRH C29-C36	50	mg/kg	< 50	67	-
TRH C10-C36 (Total)	50	mg/kg	< 50	121	-
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	%	117	114	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-
TRH >C10-C40 (total)*	100	mg/kg	< 100	100	-
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	%	114	102	-
p-Terphenyl-d14 (surr.)	1	%	114	97	-

Client Sample ID			TP55-0.0-0.2	TP56-0.1-0.4	DUP-05
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn21936	S19-Jn21937	S19-Jn21938
Date Sampled			Jun 19, 2019	Jun 19, 2019	Jun 19, 2019
Test/Reference	LOR	Unit			
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	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-
Dibutylchloredate (surr.)	1	%	108	89	-
Tetrachloro-m-xylene (surr.)	1	%	100	88	-
Polychlorinated Biphenyls					
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-
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	-
Dibutylchloredate (surr.)	1	%	108	89	-
Tetrachloro-m-xylene (surr.)	1	%	100	88	-
Heavy Metals					
Arsenic	2	mg/kg	2.3	3.1	< 2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	24	5.1	7.8
Copper	5	mg/kg	18	13	15
Lead	5	mg/kg	48	94	72
Mercury	0.1	mg/kg	2.1	0.1	< 0.1
Nickel	5	mg/kg	15	< 5	8.7
Zinc	5	mg/kg	110	110	67
% Moisture	1	%	10	7.8	8.3

Sample History

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

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 25, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 25, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 25, 2019	
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Jun 25, 2019	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jun 25, 2019	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Jun 25, 2019	14 Days
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Jun 25, 2019	28 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jun 25, 2019	180 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jun 25, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jun 19, 2019	14 Days

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Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661620
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 19, 2019 3:20 PM
Due: Jun 26, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	BH02A-0.0-0.3	Jun 19, 2019		Soil	S19-Jn21896				X						X	
2	BH02B-0.0-0.3	Not Provided		Soil	S19-Jn21897				X						X	
3	BH02C-0.0-0.3	Not Provided		Soil	S19-Jn21898				X						X	
4	BH02D-0.0-0.3	Not Provided		Soil	S19-Jn21899				X						X	
5	SS02A-0.0-0.3	Not Provided		Soil	S19-Jn21900	X										
6	SS02B-0.0-0.3	Not Provided		Soil	S19-Jn21901	X										
7	SS02C-0.0-0.3	Not Provided		Soil	S19-Jn21902	X										
8	SS02D-0.0-0.3	Not Provided		Soil	S19-Jn21903	X										
9	TP04A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21904					X					X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TP04A-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21905					X					X	
11	TP04B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21906					X					X	
12	TP04C-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21907					X					X	
13	TP04C-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21908					X					X	
14	TP04D-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21909					X					X	
15	TP04D-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21910					X					X	
16	TP04D-1.5-1.7	Jun 19, 2019		Soil	S19-Jn21911					X					X	
17	TP07A-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21912	X										
18	TP07B-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21913	X										
19	TP07C-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21914	X										
20	TP07D-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21915	X										
21	TP22A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21916									X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
22	TP22A-1.0-1.2	Jun 19, 2019		Soil	S19-Jn21917									X	X	
23	TP22B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21918									X	X	
24	TP22B-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21919									X	X	
25	TP22C-0.0-0.3	Jun 19, 2019		Soil	S19-Jn21920				X						X	
26	TP22C1.1-1.3	Jun 19, 2019		Soil	S19-Jn21921				X						X	
27	TP22D-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21922				X						X	
28	TP22D-1.1-1.3	Jun 19, 2019		Soil	S19-Jn21923				X						X	
29	TP23A-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21924					X					X	
30	TP23B-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21925					X					X	
31	TP23C-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21926					X					X	
32	TP23D-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21927					X			X		X	
33	TP42-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21928								X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
34	TP42-0.4-0.6	Jun 19, 2019		Soil	S19-Jn21929								X	X	X	X
35	TP43-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21930								X	X	X	X
36	TP43-0.5-0.1	Jun 19, 2019		Soil	S19-Jn21931								X	X	X	X
37	TP44-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21932								X	X	X	X
38	TP44-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21933								X	X	X	X
39	TP45-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21934	X							X		X	
40	TP47-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21935	X				X	X	X	X	X	X	X
41	TP55-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21936	X				X	X	X	X	X	X	X
42	TP56-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21937	X				X	X	X	X	X	X	X
43	DUP-05	Jun 19, 2019		Soil	S19-Jn21938								X		X	
44	FCS-TP04B	Jun 19, 2019		Building Materials	S19-Jn21939		X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
45	FCS-TP07A	Jun 19, 2019		Building Materials	S19-Jn21940		X									
46	FCS-TP042	Jun 19, 2019		Building Materials	S19-Jn21941		X									
47	TRIP SPIKE	Jun 19, 2019		Water	S19-Jn21942									X		
48	TRIP BLANK	Jun 19, 2019		Water	S19-Jn21943									X		
49	SS02A-0.7-1.0	Jun 19, 2019		Soil	S19-Jn21944			X								
50	SS02D-0.7-1.0	Jun 19, 2019		Soil	S19-Jn21945			X								
51	TP44-1.5-1.7	Jun 19, 2019		Soil	S19-Jn21946			X								
52	TP47-0.4-0.6	Jun 19, 2019		Soil	S19-Jn21947			X								
53	TP55-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21948			X								
54	FCS-TP44	Jun 19, 2019		Building Materials	S19-Jn22224		X									

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Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Test Counts	12	4	5	8	15	3	3	12	15	35	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	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							
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	%	83			70-130	Pass	
TRH C10-C14	%	98			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	102			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	110			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
o-Xylene	%	107			70-130	Pass	
Xylenes - Total	%	106			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	119			70-130	Pass	
TRH C6-C10	%	79			70-130	Pass	
TRH >C10-C16	%	101			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	128			70-130	Pass	
Acenaphthylene	%	129			70-130	Pass	
Anthracene	%	128			70-130	Pass	
Benz(a)anthracene	%	123			70-130	Pass	
Benzo(a)pyrene	%	120			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	117			70-130	Pass	
Benzo(g,h,i)perylene			%	123			70-130	Pass	
Benzo(k)fluoranthene			%	126			70-130	Pass	
Chrysene			%	127			70-130	Pass	
Dibenz(a,h)anthracene			%	118			70-130	Pass	
Fluoranthene			%	126			70-130	Pass	
Fluorene			%	126			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	123			70-130	Pass	
Naphthalene			%	121			70-130	Pass	
Phenanthrene			%	126			70-130	Pass	
Pyrene			%	126			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
4,4'-DDD			%	130			70-130	Pass	
4,4'-DDE			%	119			70-130	Pass	
4,4'-DDT			%	120			70-130	Pass	
a-BHC			%	120			70-130	Pass	
Aldrin			%	117			70-130	Pass	
b-BHC			%	109			70-130	Pass	
d-BHC			%	123			70-130	Pass	
Dieldrin			%	119			70-130	Pass	
Endosulfan I			%	118			70-130	Pass	
Endosulfan II			%	127			70-130	Pass	
Endosulfan sulphate			%	124			70-130	Pass	
Endrin			%	116			70-130	Pass	
Endrin aldehyde			%	124			70-130	Pass	
Endrin ketone			%	118			70-130	Pass	
g-BHC (Lindane)			%	119			70-130	Pass	
Heptachlor			%	118			70-130	Pass	
Heptachlor epoxide			%	119			70-130	Pass	
Hexachlorobenzene			%	112			70-130	Pass	
Methoxychlor			%	116			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	85			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	102			70-130	Pass	
Cadmium			%	103			70-130	Pass	
Chromium			%	102			70-130	Pass	
Copper			%	103			70-130	Pass	
Lead			%	104			70-130	Pass	
Mercury			%	100			70-130	Pass	
Nickel			%	103			70-130	Pass	
Zinc			%	102			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Jn21897	CP	%	118			70-130	Pass	
Cadmium	S19-Jn21897	CP	%	118			70-130	Pass	
Chromium	S19-Jn21897	CP	%	120			70-130	Pass	
Copper	S19-Jn21897	CP	%	125			70-130	Pass	
Lead	S19-Jn21897	CP	%	127			70-130	Pass	
Mercury	S19-Jn21897	CP	%	123			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Nickel	S19-Jn21897	CP	%	116		70-130	Pass	
Zinc	S19-Jn21897	CP	%	122		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S19-Jn21905	CP	%	95		70-130	Pass	
Acenaphthylene	S19-Jn21905	CP	%	95		70-130	Pass	
Anthracene	S19-Jn21905	CP	%	98		70-130	Pass	
Benz(a)anthracene	S19-Jn21905	CP	%	89		70-130	Pass	
Benzo(a)pyrene	S19-Jn21905	CP	%	92		70-130	Pass	
Benzo(b&j)fluoranthene	S19-Jn21905	CP	%	88		70-130	Pass	
Benzo(g,h,i)perylene	S19-Jn21905	CP	%	91		70-130	Pass	
Benzo(k)fluoranthene	S19-Jn21905	CP	%	98		70-130	Pass	
Chrysene	S19-Jn21905	CP	%	93		70-130	Pass	
Dibenz(a,h)anthracene	S19-Jn21905	CP	%	85		70-130	Pass	
Fluoranthene	S19-Jn21905	CP	%	92		70-130	Pass	
Fluorene	S19-Jn21905	CP	%	97		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S19-Jn21905	CP	%	88		70-130	Pass	
Naphthalene	S19-Jn21905	CP	%	91		70-130	Pass	
Phenanthrene	S19-Jn21905	CP	%	97		70-130	Pass	
Pyrene	S19-Jn21905	CP	%	92		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S19-Jn21917	CP	%	85		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	S19-Jn21917	CP	%	98		70-130	Pass	
Toluene	S19-Jn21917	CP	%	104		70-130	Pass	
Ethylbenzene	S19-Jn21917	CP	%	105		70-130	Pass	
m&p-Xylenes	S19-Jn21917	CP	%	102		70-130	Pass	
o-Xylene	S19-Jn21917	CP	%	102		70-130	Pass	
Xylenes - Total	S19-Jn21917	CP	%	102		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S19-Jn21917	CP	%	116		70-130	Pass	
TRH C6-C10	S19-Jn21917	CP	%	83		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S19-Jn21842	NCP	%	106		70-130	Pass	
Cadmium	S19-Jn24355	NCP	%	126		70-130	Pass	
Chromium	S19-Jn24355	NCP	%	127		70-130	Pass	
Copper	S19-Jn24344	NCP	%	128		70-130	Pass	
Mercury	S19-Jn24355	NCP	%	125		70-130	Pass	
Nickel	S19-Jn24355	NCP	%	127		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	S19-Jn12556	NCP	%	84		70-130	Pass	
TRH C10-C14	S19-Jn21441	NCP	%	96		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	S19-Jn12556	NCP	%	93		70-130	Pass	
TRH C6-C10	S19-Jn12556	NCP	%	76		70-130	Pass	
TRH >C10-C16	S19-Jn21441	NCP	%	99		70-130	Pass	
Spike - % Recovery								
Organochlorine Pesticides				Result 1				

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDD	S19-Jn20054	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDE	S19-Jn21936	CP	%	123			70-130	Pass	
4.4'-DDT	S19-Jn21936	CP	%	117			70-130	Pass	
a-BHC	S19-Jn21936	CP	%	125			70-130	Pass	
Aldrin	S19-Jn21936	CP	%	123			70-130	Pass	
b-BHC	S19-Jn21936	CP	%	111			70-130	Pass	
d-BHC	S19-Jn21936	CP	%	127			70-130	Pass	
Dieldrin	S19-Jn21936	CP	%	126			70-130	Pass	
Endosulfan I	S19-Jn21936	CP	%	121			70-130	Pass	
Endosulfan II	S19-Jn21936	CP	%	127			70-130	Pass	
Endosulfan sulphate	S19-Jn21936	CP	%	121			70-130	Pass	
Endrin	S19-Jn21936	CP	%	117			70-130	Pass	
Endrin aldehyde	S19-Jn21936	CP	%	122			70-130	Pass	
Endrin ketone	S19-Jn21936	CP	%	119			70-130	Pass	
g-BHC (Lindane)	S19-Jn21936	CP	%	115			70-130	Pass	
Heptachlor	S19-Jn21936	CP	%	125			70-130	Pass	
Heptachlor epoxide	S19-Jn21936	CP	%	123			70-130	Pass	
Hexachlorobenzene	S19-Jn21936	CP	%	119			70-130	Pass	
Methoxychlor	S19-Jn21936	CP	%	114			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S19-Jn21936	CP	%	78			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Jn21896	CP	mg/kg	3.5	6.8	<1	30%	Pass	
Cadmium	S19-Jn21896	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Jn21896	CP	mg/kg	7.7	7.4	4.0	30%	Pass	
Copper	S19-Jn21896	CP	mg/kg	5.3	10	<1	30%	Pass	
Lead	S19-Jn21896	CP	mg/kg	5.9	10	<1	30%	Pass	
Mercury	S19-Jn21896	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Jn21896	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-Jn21896	CP	mg/kg	25	28	12	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Jn21896	CP	%	7.3	7.5	4.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&i)fluoranthene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Phenanthrene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S19-Jn21107	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S19-Jn21910	CP	%	8.4	8.7	4.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S19-Jn21916	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S19-Jn21916	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S19-Jn21916	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S19-Jn21916	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S19-Jn21916	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S19-Jn21916	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S19-Jn21916	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S19-Jn21916	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S19-Jn21916	CP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S19-Jn21924	CP	%	7.3	7.6	4.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S19-Jn24354	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Cadmium	S19-Jn24354	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S19-Jn24354	NCP	mg/kg	7.4	7.2	3.0	30%	Pass
Copper	S19-Jn24354	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	S19-Jn24354	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S19-Jn24354	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S19-Jn24354	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	B19-Jn23955	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	S19-Jn21439	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S19-Jn21439	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S19-Jn21439	NCP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	B19-Jn23955	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	B19-Jn23955	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S19-Jn21439	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S19-Jn21439	NCP	mg/kg	< 100		40	30%	Fail
TRH >C34-C40	S19-Jn21439	NCP	mg/kg	< 100		22	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S19-Jn21934	CP	%	15	14	11	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S19-Jn21935	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
a-BHC	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S19-Jn21935	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S19-Jn21935	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S19-Jn21935	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S19-Jn21935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S19-Jn21935	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S19-Jn21935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S19-Jn21935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S19-Jn21935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S19-Jn21935	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S19-Jn21935	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	No
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
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Aidan Rooney
Report 661620-AID
Project Name MEADOWBANK
Project ID 9280
Received Date Jun 19, 2019
Date Reported Jun 26, 2019

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name MEADOWBANK
Project ID 9280
Date Sampled Jun 19, 2019
Report 661620-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
SS02A-0.0-0.3	19-Jn21900	not provided	Approximate Sample 783g Sample consisted of: Brown fine-grained soil, fragments of brick, corroded metal, glass and debris, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS02B-0.0-0.3	19-Jn21901	not provided	Approximate Sample 886g Sample consisted of: Brown fine-grained soil, fragments of corroded metal and glass, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS02C-0.0-0.3	19-Jn21902	not provided	Approximate Sample 684g Sample consisted of: Brown fine-grained soil, fragments of corroded metal and cement, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS02D-0.0-0.3	19-Jn21903	not provided	Approximate Sample 649g Sample consisted of: Brown fine-grained soil, fragments of glass, and rocks	FA: Chrysotile asbestos detected in weathered fibre cement fragments. Approximate raw weight of FA = 0.012g Estimated asbestos content in FA = 0.0070g* Total estimated asbestos concentration in FA = 0.0011% w/w* Organic fibre detected. No respirable fibres detected.
TP07A-0.1-0.4	19-Jn21912	Jun 19, 2019	Approximate Sample 684g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
TP07B-0.1-0.4	19-Jn21913	Jun 19, 2019	Approximate Sample 601g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
TP07C-0.1-0.4	19-Jn21914	Jun 19, 2019	Approximate Sample 700g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP07D-0.1-0.4	19-Jn21915	Jun 19, 2019	Approximate Sample 619g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP45-0.1-0.4	19-Jn21934	Jun 19, 2019	Approximate Sample 732g Sample consisted of: Brown fine-grained soil, fragments of cement and bricks, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP47-0.0-0.2	19-Jn21935	Jun 19, 2019	Approximate Sample 670g Sample consisted of: Brown fine-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP55-0.0-0.2	19-Jn21936	Jun 19, 2019	Approximate Sample 701g Sample consisted of: Brown coarse-grained soil, fragments of brick and bitumen, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP56-0.1-0.4	19-Jn21937	Jun 19, 2019	Approximate Sample 635g Sample consisted of: Brown coarse-grained soil, fragments of brick and bitumen, and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
FCS-TP04B	19-Jn21939	Jun 19, 2019	Approximate Sample 47g / 95x55x5mm Sample consisted of: (a) Grey compressed fibre cement material (b) Green paint	Chrysotile and amosite asbestos detected (a).
FCS-TP07A	19-Jn21940	Jun 19, 2019	Approximate Sample 30g / 65x40x5mm Sample consisted of: (a) Grey compressed fibre cement material (b) White paint	Chrysotile asbestos detected (a).
FCS-TP042	19-Jn21941	Jun 19, 2019	Approximate Sample 16g / 60x30x5mm Sample consisted of: Grey compressed fibre cement material and white paint	No asbestos detected. Organic fibre detected. No respirable fibres detected.
FCS-TP44	19-Jn22224	Jun 19, 2019	Approximate Sample 66g / 110x90x5mm Sample consisted of: Grey compressed fibre cement material and white paint	No asbestos detected. Organic fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 26, 2019	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Jun 26, 2019	Indefinite

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661620
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 19, 2019 3:20 PM
Due: Jun 26, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	BH02A-0.0-0.3	Jun 19, 2019		Soil	S19-Jn21896				X						X	
2	BH02B-0.0-0.3	Not Provided		Soil	S19-Jn21897				X						X	
3	BH02C-0.0-0.3	Not Provided		Soil	S19-Jn21898				X						X	
4	BH02D-0.0-0.3	Not Provided		Soil	S19-Jn21899				X						X	
5	SS02A-0.0-0.3	Not Provided		Soil	S19-Jn21900	X										
6	SS02B-0.0-0.3	Not Provided		Soil	S19-Jn21901	X										
7	SS02C-0.0-0.3	Not Provided		Soil	S19-Jn21902	X										
8	SS02D-0.0-0.3	Not Provided		Soil	S19-Jn21903	X										
9	TP04A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21904					X					X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
10	TP04A-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21905					X					X	
11	TP04B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21906					X					X	
12	TP04C-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21907					X					X	
13	TP04C-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21908					X					X	
14	TP04D-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21909					X					X	
15	TP04D-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21910					X					X	
16	TP04D-1.5-1.7	Jun 19, 2019		Soil	S19-Jn21911					X					X	
17	TP07A-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21912	X										
18	TP07B-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21913	X										
19	TP07C-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21914	X										
20	TP07D-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21915	X										
21	TP22A-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21916									X	X	

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
22	TP22A-1.0-1.2	Jun 19, 2019		Soil	S19-Jn21917									X	X	
23	TP22B-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21918									X	X	
24	TP22B-0.9-1.1	Jun 19, 2019		Soil	S19-Jn21919									X	X	
25	TP22C-0.0-0.3	Jun 19, 2019		Soil	S19-Jn21920				X						X	
26	TP22C1.1-1.3	Jun 19, 2019		Soil	S19-Jn21921				X						X	
27	TP22D-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21922				X						X	
28	TP22D-1.1-1.3	Jun 19, 2019		Soil	S19-Jn21923				X						X	
29	TP23A-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21924					X					X	
30	TP23B-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21925					X					X	
31	TP23C-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21926					X					X	
32	TP23D-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21927					X			X		X	
33	TP42-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21928								X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
34	TP42-0.4-0.6	Jun 19, 2019		Soil	S19-Jn21929								X	X	X	X
35	TP43-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21930								X	X	X	X
36	TP43-0.5-0.1	Jun 19, 2019		Soil	S19-Jn21931								X	X	X	X
37	TP44-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21932								X	X	X	X
38	TP44-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21933								X	X	X	X
39	TP45-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21934	X							X		X	
40	TP47-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21935	X				X	X	X	X	X	X	X
41	TP55-0.0-0.2	Jun 19, 2019		Soil	S19-Jn21936	X				X	X	X	X	X	X	X
42	TP56-0.1-0.4	Jun 19, 2019		Soil	S19-Jn21937	X				X	X	X	X	X	X	X
43	DUP-05	Jun 19, 2019		Soil	S19-Jn21938								X		X	
44	FCS-TP04B	Jun 19, 2019		Building Materials	S19-Jn21939		X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
45	FCS-TP07A	Jun 19, 2019		Building Materials	S19-Jn21940		X									
46	FCS-TP042	Jun 19, 2019		Building Materials	S19-Jn21941		X									
47	TRIP SPIKE	Jun 19, 2019		Water	S19-Jn21942									X		
48	TRIP BLANK	Jun 19, 2019		Water	S19-Jn21943									X		
49	SS02A-0.7-1.0	Jun 19, 2019		Soil	S19-Jn21944			X								
50	SS02D-0.7-1.0	Jun 19, 2019		Soil	S19-Jn21945			X								
51	TP44-1.5-1.7	Jun 19, 2019		Soil	S19-Jn21946			X								
52	TP47-0.4-0.6	Jun 19, 2019		Soil	S19-Jn21947			X								
53	TP55-0.8-1.0	Jun 19, 2019		Soil	S19-Jn21948			X								
54	FCS-TP44	Jun 19, 2019		Building Materials	S19-Jn22224		X									

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Melbourne Laboratory - NATA Site # 1254 & 14271											
Sydney Laboratory - NATA Site # 18217	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
Test Counts	12	4	5	8	15	3	3	12	15	35	9

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN OF CUSTODY RECORD

Sydney Laboratory
Unit F3 1st Fl. 15 Macquarie Lane, Macquarie NSW 2108
02 9550 5416 EnviroSample@sydney.eurofins.com

Brisbane Laboratory
Unit 1, 21 Smallwood Pl. Marston QLD 4172
07 3850 4900 EnviroSample@brisbane.eurofins.com

Perth Laboratory
Unit 7, 21 Leckell Highway, Kalamunda WA 6105
08 9251 9930 EnviroSample@perth.eurofins.com

Melbourne Laboratory
2 Kingston Turn Circle, Oakleigh VIC 3166
03 9504 5000 EnviroSample@melbourne.eurofins.com

Company	ALLIANCE GEOTECHNICAL		Project No	9280		Project Manager	Aiden Rooney		Sampler(s)	Sam Scully										
Address	10 WELDER ROAD, SEVEN HILLS NSW		Project Name	Meadowbank		EDD Format (ESdat, EQUIS, Custom)			Handed over by											
Contact Name	Sam Scully		Analyses (Note: Where results are requested, please specify "Total" or "Filterable". Some limits may be used to meet SLOTE testing)	lead	BTEX	PAH	8 Metals	VOCs	OCP	PCB	Phenols	Asbestos (0.001%)	Asbestos 1.D	Holo	Email for Invoice	admin@allgeo.com.au				
Phone No	400339745														Email for Results	sam@allgeo.com.au				
Special Directions															Containers		Turnaround Time (TAT) Requirements (default will be 1 day if not noted)			
Purchase Order															1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle
Quote ID No			No	Client Sample ID	Sampled Date/Time (dd/mm/yyyy hh:mm)	Matrix (Solid (S) Water (W))											Sample Comments / Dangerous Goods Hazard Warning			
1	BH02A-0.0-0.3		19-6-19	Sa1	X															
2	BH02B-0.0-0.3				X															
3	BH02C-0.0-0.3				X															
4	BH02D-0.0-0.3				X															
5	SS02A-0.0-0.3										X									
6	SS02A-0.7-1.0												X							
7	SS02B-0.0-0.3										X									
8	SS02C-0.0-0.3										X									
9	SS02D-0.0-0.3										X									
10	SS02D-0.7-1.0												X							
	TP04A-0.0-0.2							X												
	TP04A-0.9-1.1							X												
	TP04B-0.0-0.2							X												
	TP04C-0.0-0.2							X												
	TP04C-0.8-1.0							X												
	TP04D-0.0-0.2							X												
	TP04D-0.9-1.1							X												
	TP04D-1.5-1.7							X												
	TP07A-0.1-0.4										X									
	TP07B-0.1-0.4										X									
	TP07C-0.1-0.4										X									
	TP07D-0.1-0.4										X									
	TP22A-0.0-0.2							X												
	TP22A-1.0-1.2							X												
	TP22B-0.0-0.2							X												
	TP22B-0.9-1.1							X												
Total Counts																				
Method of Shipment	Courier (#)		X Hand Delivered		Postal	Name	Sam Scully		Signature	Date		19/06/2019		Time		3:30pm				
Eurofins mgt Laboratory Use Only	Received By	SYD BNE MEL PER ADL NTL DRW		Signature	Date		19/6/19		Time	3:20		Report No	641620							

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



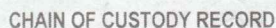
- Sydney Laboratory**
 Unit F3 Bld F, 18 Mars Rd, Lane Cove West, NSW 2056
 02 9550 5400 EnvirosampleNSW@neurotes.com

• **Brisbane Laboratory**
Unit 1, 21 Smallwood Pl, Murarie, QLD 4172
07 3300 4500 EnviroSampleQLD@pacific.net.au

• **Perth Laboratory**
Unit 2, 91 Leach Highway, Kewdale WA 6105
(08) 9251 9300. EnviroSampleWA@chemtrics.com

- Melbourne Laboratory**
 2 Kingston Town Close, Oakleigh, VIC 3166
 03 9564 5000 Email: SampleInfo@bioneflex.com

Company		ALLIANCE GEOTECHNICAL		Project No		9280		Project Manager		Aiden Rooney		Sampler(s)		Sam Scully	
Address		10 WELDER ROAD, SEVEN HILLS NSW		Project Name		Meadowbank		EDD Format (ESdat, EQUIS, Custom)				Handed over by			
Contact Name		Sam Scully		Email for Invoice		admin@allgeo.com.au		Email for Results		sam@allgeo.com.au		Containers		Turnaround Time (TAT) Requirements (Default will be 1 day Freehold)	
Phone No		400339745		Overnight (9am)*		1 Day*		2 Day*		3 Day*		5 Day*		Other ()	
Special Directions				Sample Comments / Dangerous Goods Hazard Warning											
Purchase Order															
Quote ID No															
No	Client Sample ID	Sampled Date/Time (dd/mm/yyyy hh:mm)	Matrix (Solid (S) Water (W))	Lead	BTEX	PAH	8 Metals	VOCs	OCF	PCB	Phenols	Asbestos (0.001%)	Asbestos I.D.	HeLD	TRH
1	TP22C-0.0-0.2	19-6-19	Soil	X											
2	TP22C-1.1-1.3			X											
3	TP22D-0.0-0.2			X											
4	TP22D-1.1-1.3			X											
5	TP23A-0.1-0.4					X									
6	TP23B-0.1-0.4					X									
7	TP23C-0.1-0.4					X									
8	TP23D-0.1-0.4					X									
9	TP42-0.0-0.2				X		X						X		
10	TP42-0.4-0.6				X		X						X		
	TP43-0.0-0.2				X		X						X		
	TP43-0.5-0.7				X		X						X		
	TP44-0.0-0.2				X		X						X		
	TP44-0.8-1.0				X		X						X		
	TP44-1.5-1.7											X	●		
	TP45-0.1-0.4						X				X				
	TP47-0.0-0.2				X	X	X		X	X	X		X		
	TP47-0.4-0.6											X	●		
	TP55-0.0-0.2				X	X	X		X	X	X		X		
	TP55-0.8-1.0											X	●		
	TP56-0.1-0.4				X	X	X		X	X	X		X		
	DUP-05						X								
	DUP-5A						X								
	FCS-TP04B											X			
	FCS-TP07A											X			
	FCS-TP42											X			
Total Counts															
Method of Shipment				Courier (#)	X Hand Delivered	Postal	Name	Sam Scully	Signature		Date	19/06/2019	Time	5:30	
Eurofins mgt				Received By		SYD BNE MEL PER ADL NTL DRW	Signature		Date	19/6/19	Time	3:20pm	Temperature		
Laboratory Use Only				Received By		SYD BNE MEL PER ADL NTL DRW	Signature		Date	19/6/19	Time	3:20pm	Report No	66162	



888.527.625.624

- Sydney Laboratory

Unit F3 Bld F 16 Mars Rd, Lane Cove West, NSW 2059
02 9600 5436 Email: Samples@SWZBiotech.com

- Brisbane Laboratory

Unit 1, 21 Smallwood Pl., Muramba, QLD 4172
07 3900 4633. Email: Sample@21Smallwood.com

- Perth Laboratory

Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 5830 EnviroSampleWA@secoffices.com

- Melbourne Laboratory

2 Kingston Town Close, Oakeleigh, VIC 3106
(03) 8554 5053 Environ@samhale.com.au

[illegible]

Submission of samples to the laboratory will be deemed as acceptance of Eurofins' not Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins' not Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgmt

Enviro Sample NSW

To: Sam Scully
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 661620 : Site MEADOWBANK (9280)

-----Original Message-----

From: Sam Scully [<mailto:sam@allgeo.com.au>]
Sent: Wednesday, 19 June 2019 6:46 PM
To: Enviro Sample NSW
Subject: Re: Eurofins | mgt Sample Receipt Advice - Report 661620 : Site MEADOWBANK (9280)

Thanks,

Please analyse the extra bag (FCS-TP44) for asbestos ID.

Kinda regards,

Sam

Sent from my iPhone

> On 19 Jun 2019, at 6:35 pm, "EnviroSampleNSW@eurofins.com" <EnviroSampleNSW@eurofins.com> wrote:
>
> Dear Valued Client,
>
> DUP-5A Sent to ALS, Extra bag received FCS-TP44 placed on hold.
>
> Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.
>
>
>
> Regards
>
> Luca Dominici
> Sample Receipt
>
> Eurofins | mgt
> Unit F3, Parkview Building
> 16 Mars Road
> LANE COVE WEST NSW 2066
> AUSTRALIA
> Phone: +61 29900 8421
> Email:
> EnviroSampleNSW@eurofins.com<<http://elvis.eurofins.com.au/MGT/admin/mailtoEnviroSampleNSW@eurofins.com>> Website:environment.eurofins.com.au
> <<http://>>
>
> EnviroNote 1079 - PFAS
> Fingerprinting<<https://www.eurofins.com.au/environmental-testing/compa>

> ny/news/environote-1079-pfas-fingerprinting/>
> EnviroNote 1080 - Total Organofluorine Analysis & PFAS
> Investigations<<https://www.eurofins.com.au/environmental-testing/compa>
> ny/news/environote-1080-total-organofluorine-analysis-pfas-investigati
> ons/>
> <661620_COC.pdf>
> <661620_sample_receipt_coc.pdf>
> <661620_summary.pdf>

ScannedByWebsenseForEurofins

Enviro Sample NSW

From: Sam Scully <sam@allgeo.com.au>
Sent: Thursday, 20 June 2019 1:00 PM
To: Enviro Sample NSW
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 661620 : Site MEADOWBANK (9280)

Follow Up Flag: Follow up
Flag Status: Flagged

Thanks,

Could we please get soil sample TP23D-0.1-0.4 analysed for metals on 5 day TAT.

Please do not hesitate to contact me if you have any queries or questions,

Kind Regards,

Sam Scully

Environmental Consultant - 0400 339 745 | Email: sam@allgeo.com.au

 Alliance Geotechnical ENGINEERING ENVIRONMENTAL TESTING Your On-Site Geotechnical & Environmental Specialists	 OH&S QUALITY ENVIRONMENT OH&S
<p>Office Email: admin@allgeo.com.au - Website: allgeo.com.au - Office Phone: 1800 288 188</p> <p>Postal Address: PO Box 275, Seven Hills NSW 1730 / Office & Laboratory Address: 10 Welder Road, Seven Hills NSW 2147</p>	

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Thursday, 20 June 2019 12:13 PM
To: Aidan Rooney <aidan@allgeo.com.au>
Cc: enviro <enviro@allgeo.com.au>; Sam Scully <sam@allgeo.com.au>
Subject: Eurofins | mgt Sample Receipt Advice - Report 661620 : Site MEADOWBANK (9280)

Dear Valued Client,

DUP-5A Sent to ALS.

Please find attached an amended Sample Receipt Advice (SRA), an amended Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Luca Dominici
Sample Receipt

Eurofins | mgt

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

Phone: +61 29900 8421

Email: EnviroSampleNSW@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1079 - PFAS Fingerprinting](#)

[EnviroNote 1080 - Total Organofluorine Analysis & PFAS Investigations](#)

Click [here](#) to report this email as spam.

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Aidan Rooney**

Report **661368-W**
 Project name **MEADOWBANK**
 Project ID **9280**
 Received Date **Jun 18, 2019**

Client Sample ID			TRIP SPIKE	TRIP BLANK
Sample Matrix			Water	Water
Eurofins mgt Sample No.			S19-Jn20073	S19-Jn20074
Date Sampled			Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	88	< 0.001
Toluene	0.001	mg/L	87	< 0.001
Ethylbenzene	0.001	mg/L	85	< 0.001
m&p-Xylenes	0.002	mg/L	84	< 0.002
o-Xylene	0.001	mg/L	87	< 0.001
Xylenes - Total	0.003	mg/L	85	< 0.003
4-Bromofluorobenzene (surr.)	1	%	120	129

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

BTEX

Testing Site

Sydney

Extracted

Jun 18, 2019

Holding Time

14 Days

- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661368
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 18, 2019 4:21 PM
Due: Jun 25, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	SS03A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20027	X										
2	SS03B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20028	X										
3	SS03C_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20029	X										
4	TP16A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20030					X					X	
5	TP16A_1.6-1.7	Jun 18, 2019		Soil	S19-Jn20031					X					X	
6	TP16B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20032					X					X	
7	TP16B_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20033					X					X	

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
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Priority: 5 Day
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Eurofins | mgt Analytical Services Manager : Andrew Black

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
8	TP16C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20034					X					X	
9	TP16C_1.8-2.0	Jun 18, 2019		Soil	S19-Jn20035					X					X	
10	TP16D_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20036					X					X	
11	TP16D_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20037					X					X	
12	TP24A_0.1-0.4	Jun 18, 2019		Soil	S19-Jn20038				X						X	
13	TP24B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20039				X						X	
14	TP24B_0.3-0.5	Jun 18, 2019		Soil	S19-Jn20040				X						X	
15	TP24C_0.1-0.4	Jun 18, 2019		Soil	S19-Jn20041				X						X	
16	TP24D_0.1-	Jun 18, 2019		Soil	S19-Jn20042				X						X	

Company Name: Alliance Geotechnical
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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
	0.4															
17	TP30A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20043	X							X		X	
18	TP30A_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20044	X										
19	TP30B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20045	X										
20	TP30B_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20046	X										
21	TP30C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20047	x										
22	TP30C_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20048	x										
23	BH40C_0.1-0.3	Jun 18, 2019		Soil	S19-Jn20049	x										
24	BH40C_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20050	x										

Company Name: Alliance Geotechnical
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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
25	BH40D_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20051	X										
26	BH40D_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20052	X										
27	TP46_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20053						X		X		X	
28	TP46_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20054						X		X		X	
29	TP49_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20055	X				X	X	X	X	X	X	X
30	TP50_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20056	X				X	X	X	X	X	X	X
31	TP51_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20057	X				X	X	X	X	X	X	X
32	TP51_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20058	X				X	X	X	X	X	X	X
33	TP52_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20059	X				X	X	X	X	X	X	X
34	TP52_1.2-1.4	Jun 18, 2019		Soil	S19-Jn20060	X				X	X	X	X	X	X	X
35	TP53_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20061	X				X	X	X	X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
36	TP54_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20062	X				X	X	X	X	X	X	X
37	TP54_1.3-1.5	Jun 18, 2019		Soil	S19-Jn20063	X				X	X	X	X	X	X	X
38	TP57_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20064	X				X	X	X	X	X	X	X
39	TP57_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20065	X										
40	DUP01	Jun 18, 2019		Soil	S19-Jn20066								X		X	
41	DUP02	Jun 18, 2019		Soil	S19-Jn20067								X		X	
42	DUP03	Jun 18, 2019		Soil	S19-Jn20068								X		X	
43	DUP04	Jun 18, 2019		Soil	S19-Jn20069								X		X	
44	FCS_TP30B	Jun 18, 2019		Building Materials	S19-Jn20070		X									
45	FCS_TP30C	Jun 18, 2019		Building Materials	S19-Jn20071		X									
46	FCS_TP40C	Jun 18, 2019		Building	S19-Jn20072		X									

Company Name: Alliance Geotechnical
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Seven Hills
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Project Name: MEADOWBANK
Project ID: 9280

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Report #: 661368
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 18, 2019 4:21 PM
Due: Jun 25, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
				Materials												
47	TRIP SPIKE	Jun 18, 2019		Water	S19-Jn20073									X		
48	TRIP BLANK	Jun 18, 2019		Water	S19-Jn20074									X		
49	SS03A_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20075			X								
50	SS03B_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20076			X								
51	SS03C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20077			X								
52	TP16A_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20078			X								
53	TP16B_1.8-2.0	Jun 18, 2019		Soil	S19-Jn20079			X								
54	TP16C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20080			X								

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
55	TP30A_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20081			X								
56	TP30B_1.6-1.8	Jun 18, 2019		Soil	S19-Jn20082			X								
57	TP30C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20083								X		X	
58	BH40C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20084			X								
59	BH40D_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20085			X								
60	TP50_0.2-0.4	Jun 18, 2019		Soil	S19-Jn20086			X								
61	TP51_1.3-1.5	Jun 18, 2019		Soil	S19-Jn20087			X								
62	TP52_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20088			X								
63	TP53_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20089			X								
64	TP53_1.2-1.4	Jun 18, 2019		Soil	S19-Jn20090			X								

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Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217				X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
65	TP54_0.6-0.8	Jun 18, 2019	Soil	S19-Jn20091		X								
Test Counts				24	3	16	5	18	12	10	18	12	31	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
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	
LCS - % Recovery									
BTEX									
Benzene			%	90			70-130	Pass	
Toluene			%	89			70-130	Pass	
Ethylbenzene			%	88			70-130	Pass	
m&p-Xylenes			%	89			70-130	Pass	
o-Xylene			%	90			70-130	Pass	
Xylenes - Total			%	89			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Jn13611	NCP	%	100			70-130	Pass	
Toluene	S19-Jn13611	NCP	%	102			70-130	Pass	
Ethylbenzene	S19-Jn13611	NCP	%	100			70-130	Pass	
m&p-Xylenes	S19-Jn13611	NCP	%	98			70-130	Pass	
o-Xylene	S19-Jn13611	NCP	%	101			70-130	Pass	
Xylenes - Total	S19-Jn13611	NCP	%	99			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Jn23910	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S19-Jn23910	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S19-Jn23910	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S19-Jn23910	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S19-Jn23910	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S19-Jn23910	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
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

Authorised By

Andrew Black Analytical Services Manager



Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Aidan Rooney

Report 661368-S
Project name MEADOWBANK
Project ID 9280
Received Date Jun 18, 2019

Client Sample ID			TP16A_0.0-0.2	TP16A_1.6-1.7	TP16B_0.0-0.2	TP16B_0.9-1.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20030	S19-Jn20031	S19-Jn20032	S19-Jn20033
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.0	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.3	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.6	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	0.8	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.8	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	0.6	< 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	0.6	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	0.8	< 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	1.6	< 0.5	< 0.5	0.7
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	0.6	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.4	< 0.5	< 0.5	0.6
Total PAH*	0.5	mg/kg	7.7	< 0.5	< 0.5	1.3
2-Fluorobiphenyl (surr.)	1	%	95	120	112	112
p-Terphenyl-d14 (surr.)	1	%	112	124	136	117
% Moisture	1	%	7.2	6.7	9.5	10

Client Sample ID			TP16C_0.9-1.1	TP16C_1.8-2.0	TP16D_0.0-0.2	TP16D_0.7-0.9
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20034	S19-Jn20035	S19-Jn20036	S19-Jn20037
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.0	0.8	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.3	1.1	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.5	1.4	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
Benzo(a)anthracene	0.5	mg/kg	0.7	0.7	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.8	0.7	< 0.5	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	0.6	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	0.7	0.7	< 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	1.4	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	< 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	0.6	0.6	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.4	1.4	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	6.7	6.2	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	130	128	127	126
p-Terphenyl-d14 (surr.)	1	%	133	150	129	149
% Moisture	1	%	8.6	8.1	8.4	6.7

Client Sample ID			TP24A_0.1-0.4	TP24B_0.0-0.2	TP24B_0.3-0.5	TP24C_0.1-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20038	S19-Jn20039	S19-Jn20040	S19-Jn20041
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	25	84	10	58
% Moisture	1	%	17	24	13	14

Client Sample ID			TP24D_0.1-0.4	TP30A_0.0-0.2	TP46_0.0-0.2	TP46_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20042	S19-Jn20043	S19-Jn20053	S19-Jn20054
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
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

Client Sample ID			TP24D_0.1-0.4	TP30A_0.0-0.2	TP46_0.0-0.2	TP46_0.5-0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20042	S19-Jn20043	S19-Jn20053	S19-Jn20054
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
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
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.2	< 0.2
Dibutylchlorobenzene (surr.)	1	%	-	-	< 1	102
Tetrachloro-m-xylene (surr.)	1	%	-	-	< 1	91
Heavy Metals						
Arsenic	2	mg/kg	-	3.7	2.2	3.3
Cadmium	0.4	mg/kg	-	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	-	7.0	7.3	14
Copper	5	mg/kg	-	11	16	< 5
Lead	5	mg/kg	< 5	33	21	6.0
Mercury	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	-	< 5	15	< 5
Zinc	5	mg/kg	-	18	36	< 5
% Moisture	1	%	13	11	15	10

Client Sample ID			TP49_0.0-0.2	TP50_0.0-0.2	TP51_0.0-0.2	TP51_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20055	S19-Jn20056	S19-Jn20057	S19-Jn20058
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
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	60	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	60	< 50	< 50

Client Sample ID			TP49_0.0-0.2	TP50_0.0-0.2	TP51_0.0-0.2	TP51_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20055	S19-Jn20056	S19-Jn20057	S19-Jn20058
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
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	%	112	107	104	106
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.9	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	1.2	< 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	0.7	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	1.1	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	3.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	123	128	118	147
p-Terphenyl-d14 (surr.)	1	%	136	132	121	142
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			TP49_0.0-0.2	TP50_0.0-0.2	TP51_0.0-0.2	TP51_0.8-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20055	S19-Jn20056	S19-Jn20057	S19-Jn20058
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchloroendate (surr.)	1	%	104	112	107	96
Tetrachloro-m-xylene (surr.)	1	%	95	87	88	81
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchloroendate (surr.)	1	%	104	112	107	96
Tetrachloro-m-xylene (surr.)	1	%	95	87	88	81
Heavy Metals						
Arsenic	2	mg/kg	3.0	12	8.5	5.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	25	17	10
Copper	5	mg/kg	< 5	16	14	33
Lead	5	mg/kg	< 5	47	68	40
Mercury	0.1	mg/kg	< 0.1	0.1	0.2	< 0.1
Nickel	5	mg/kg	< 5	< 5	5.2	< 5
Zinc	5	mg/kg	< 5	64	100	74
% Moisture	1	%	10	12	12	5.0

Client Sample ID			TP52_0.0-0.2	TP52_1.2-1.4	TP53_0.9-1.1	TP54_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20059	S19-Jn20060	S19-Jn20061	S19-Jn20062
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
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	85
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	130
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	215
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	100	102	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	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	170
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	290
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	0.8	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.1	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.4	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	0.7	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.7	< 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	0.7	< 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	1.9	< 0.5	0.8	< 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	1.0	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.5	< 0.5	0.8	< 0.5
Total PAH*	0.5	mg/kg	7	< 0.5	1.6	< 0.5
2-Fluorobiphenyl (surr.)	1	%	117	123	111	130
p-Terphenyl-d14 (surr.)	1	%	135	128	133	139

Client Sample ID			TP52_0.0-0.2	TP52_1.2-1.4	TP53_0.9-1.1	TP54_0.0-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20059	S19-Jn20060	S19-Jn20061	S19-Jn20062
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchloredate (surr.)	1	%	101	95	113	114
Tetrachloro-m-xylene (surr.)	1	%	87	93	103	93
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchloredate (surr.)	1	%	101	95	113	114
Tetrachloro-m-xylene (surr.)	1	%	87	93	103	93
Heavy Metals						
Arsenic	2	mg/kg	7.5	11	9.0	3.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	14	29	16	15
Copper	5	mg/kg	27	8.2	35	36
Lead	5	mg/kg	110	21	91	67
Mercury	0.1	mg/kg	0.1	< 0.1	0.2	< 0.1
Nickel	5	mg/kg	5.5	< 5	12	8.7
Zinc	5	mg/kg	150	5.9	150	170
% Moisture	1	%	11	16	15	23

Client Sample ID			TP54_1.3-1.5	TP57_0.0-0.2	DUP01	DUP02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20063	S19-Jn20064	S19-Jn20066	S19-Jn20067
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	-
TRH C10-C14	20	mg/kg	< 20	< 20	-	-
TRH C15-C28	50	mg/kg	52	54	-	-
TRH C29-C36	50	mg/kg	78	65	-	-
TRH C10-36 (Total)	50	mg/kg	130	119	-	-
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	%	103	99	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	-	-
TRH C6-C10	20	mg/kg	< 20	< 20	-	-
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	-	-
TRH >C10-C16	50	mg/kg	< 50	< 50	-	-
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	-	-
TRH >C16-C34	100	mg/kg	110	< 100	-	-
TRH >C34-C40	100	mg/kg	< 100	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	110	< 100	-	-
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	1.3	-	-
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	1.0	-	-
Total PAH*	0.5	mg/kg	< 0.5	2.8	-	-
2-Fluorobiphenyl (surr.)	1	%	127	110	-	-
p-Terphenyl-d14 (surr.)	1	%	135	114	-	-

Client Sample ID			TP54_1.3-1.5	TP57_0.0-0.2	DUP01	DUP02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20063	S19-Jn20064	S19-Jn20066	S19-Jn20067
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit				
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	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	-	-
Dibutylchloredate (surr.)	1	%	95	85	-	-
Tetrachloro-m-xylene (surr.)	1	%	87	85	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
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	-	-
Dibutylchloredate (surr.)	1	%	95	85	-	-
Tetrachloro-m-xylene (surr.)	1	%	87	85	-	-
Heavy Metals						
Arsenic	2	mg/kg	6.1	3.9	2.8	3.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	14	14	13
Copper	5	mg/kg	14	< 5	27	28
Lead	5	mg/kg	28	18	53	43
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	9.9	< 5	11	22
Zinc	5	mg/kg	28	29	120	89
% Moisture	1	%	14	12	21	16

Client Sample ID			DUP03	DUP04	TP30C_0.0-0.2
Sample Matrix			Soil	Soil	Soil
Eurofins mgt Sample No.			S19-Jn20068	S19-Jn20069	S19-Jn20083
Date Sampled			Jun 18, 2019	Jun 18, 2019	Jun 18, 2019
Test/Reference	LOR	Unit			
Heavy Metals					
Arsenic	2	mg/kg	4.5	3.9	6.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	10	17	17
Copper	5	mg/kg	29	24	27
Lead	5	mg/kg	78	49	63
Mercury	0.1	mg/kg	< 0.1	0.1	0.2
Nickel	5	mg/kg	5.9	9.6	16
Zinc	5	mg/kg	78	130	110
% Moisture	1	%	9.8	13	16

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 - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 23, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 23, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Jun 23, 2019	
BTEX - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	Jun 23, 2019	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Sydney	Jun 23, 2019	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Jun 23, 2019	14 Days
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	Jun 23, 2019	28 Days
Metals M8 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jun 23, 2019	180 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Jun 23, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	Jun 20, 2019	14 Days

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NSW 2147
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Project ID: 9280

Order No.:
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Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 18, 2019 4:21 PM
Due: Jun 25, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	SS03A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20027	X										
2	SS03B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20028	X										
3	SS03C_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20029	X										
4	TP16A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20030					X					X	
5	TP16A_1.6-1.7	Jun 18, 2019		Soil	S19-Jn20031					X					X	
6	TP16B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20032					X					X	
7	TP16B_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20033					X					X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
8	TP16C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20034					X					X	
9	TP16C_1.8-2.0	Jun 18, 2019		Soil	S19-Jn20035					X					X	
10	TP16D_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20036					X					X	
11	TP16D_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20037					X					X	
12	TP24A_0.1-0.4	Jun 18, 2019		Soil	S19-Jn20038				X						X	
13	TP24B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20039				X						X	
14	TP24B_0.3-0.5	Jun 18, 2019		Soil	S19-Jn20040				X						X	
15	TP24C_0.1-0.4	Jun 18, 2019		Soil	S19-Jn20041				X						X	
16	TP24D_0.1-	Jun 18, 2019		Soil	S19-Jn20042				X						X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
	0.4															
17	TP30A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20043	X							X		X	
18	TP30A_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20044	X										
19	TP30B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20045	X										
20	TP30B_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20046	X										
21	TP30C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20047	x										
22	TP30C_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20048	x										
23	BH40C_0.1-0.3	Jun 18, 2019		Soil	S19-Jn20049	x										
24	BH40C_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20050	x										

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
25	BH40D_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20051	X										
26	BH40D_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20052	X										
27	TP46_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20053						X		X		X	
28	TP46_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20054						X		X		X	
29	TP49_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20055	X				X	X	X	X	X	X	X
30	TP50_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20056	X				X	X	X	X	X	X	X
31	TP51_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20057	X				X	X	X	X	X	X	X
32	TP51_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20058	X				X	X	X	X	X	X	X
33	TP52_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20059	X				X	X	X	X	X	X	X
34	TP52_1.2-1.4	Jun 18, 2019		Soil	S19-Jn20060	X				X	X	X	X	X	X	X
35	TP53_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20061	X				X	X	X	X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
36	TP54_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20062	X				X	X	X	X	X	X	X
37	TP54_1.3-1.5	Jun 18, 2019		Soil	S19-Jn20063	X				X	X	X	X	X	X	X
38	TP57_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20064	X				X	X	X	X	X	X	X
39	TP57_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20065	X										
40	DUP01	Jun 18, 2019		Soil	S19-Jn20066								X		X	
41	DUP02	Jun 18, 2019		Soil	S19-Jn20067								X		X	
42	DUP03	Jun 18, 2019		Soil	S19-Jn20068								X		X	
43	DUP04	Jun 18, 2019		Soil	S19-Jn20069								X		X	
44	FCS_TP30B	Jun 18, 2019		Building Materials	S19-Jn20070		X									
45	FCS_TP30C	Jun 18, 2019		Building Materials	S19-Jn20071		X									
46	FCS_TP40C	Jun 18, 2019		Building	S19-Jn20072		X									

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
				Materials												
47	TRIP SPIKE	Jun 18, 2019		Water	S19-Jn20073									X		
48	TRIP BLANK	Jun 18, 2019		Water	S19-Jn20074									X		
49	SS03A_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20075			X								
50	SS03B_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20076			X								
51	SS03C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20077			X								
52	TP16A_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20078			X								
53	TP16B_1.8-2.0	Jun 18, 2019		Soil	S19-Jn20079			X								
54	TP16C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20080			X								

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
55	TP30A_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20081			X								
56	TP30B_1.6-1.8	Jun 18, 2019		Soil	S19-Jn20082			X								
57	TP30C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20083								X		X	
58	BH40C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20084			X								
59	BH40D_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20085			X								
60	TP50_0.2-0.4	Jun 18, 2019		Soil	S19-Jn20086			X								
61	TP51_1.3-1.5	Jun 18, 2019		Soil	S19-Jn20087			X								
62	TP52_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20088			X								
63	TP53_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20089			X								
64	TP53_1.2-1.4	Jun 18, 2019		Soil	S19-Jn20090			X								

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
65	TP54_0.6-0.8	Jun 18, 2019		Soil	S19-Jn20091			X								
Test Counts						24	3	16	5	18	12	10	18	12	31	10

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

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

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NC	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	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							
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	%	90			70-130	Pass	
TRH C10-C14	%	90			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	94			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	102			70-130	Pass	
Xylenes - Total	%	102			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	121			70-130	Pass	
TRH C6-C10	%	87			70-130	Pass	
TRH >C10-C16	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	109			70-130	Pass	
Acenaphthylene	%	112			70-130	Pass	
Anthracene	%	112			70-130	Pass	
Benz(a)anthracene	%	113			70-130	Pass	
Benzo(a)pyrene	%	111			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(b&j)fluoranthene			%	121			70-130	Pass	
Benzo(g,h,i)perylene			%	110			70-130	Pass	
Benzo(k)fluoranthene			%	92			70-130	Pass	
Chrysene			%	115			70-130	Pass	
Dibenz(a,h)anthracene			%	109			70-130	Pass	
Fluoranthene			%	128			70-130	Pass	
Fluorene			%	108			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	109			70-130	Pass	
Naphthalene			%	107			70-130	Pass	
Phenanthrene			%	105			70-130	Pass	
Pyrene			%	121			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides									
Chlordanes - Total			%	105			70-130	Pass	
4,4'-DDD			%	121			70-130	Pass	
4,4'-DDE			%	114			70-130	Pass	
4,4'-DDT			%	112			70-130	Pass	
a-BHC			%	118			70-130	Pass	
Aldrin			%	113			70-130	Pass	
b-BHC			%	107			70-130	Pass	
d-BHC			%	119			70-130	Pass	
Dieldrin			%	113			70-130	Pass	
Endosulfan I			%	109			70-130	Pass	
Endosulfan II			%	109			70-130	Pass	
Endosulfan sulphate			%	117			70-130	Pass	
Endrin			%	112			70-130	Pass	
Endrin aldehyde			%	101			70-130	Pass	
Endrin ketone			%	112			70-130	Pass	
g-BHC (Lindane)			%	116			70-130	Pass	
Heptachlor			%	114			70-130	Pass	
Heptachlor epoxide			%	114			70-130	Pass	
Hexachlorobenzene			%	110			70-130	Pass	
Methoxychlor			%	116			70-130	Pass	
Toxaphene			%	98			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260			%	83			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	89			70-130	Pass	
Cadmium			%	90			70-130	Pass	
Chromium			%	88			70-130	Pass	
Copper			%	90			70-130	Pass	
Lead			%	93			70-130	Pass	
Mercury			%	87			70-130	Pass	
Nickel			%	92			70-130	Pass	
Zinc			%	87			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	S19-Jn20031	CP	%	121			70-130	Pass	
Acenaphthylene	S19-Jn20031	CP	%	122			70-130	Pass	
Anthracene	S19-Jn20031	CP	%	123			70-130	Pass	
Benz(a)anthracene	S19-Jn20031	CP	%	117			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	S19-Jn20031	CP	%	123			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Jn20031	CP	%	113			70-130	Pass	
Benzo(g,h,i)perylene	S19-Jn20031	CP	%	121			70-130	Pass	
Benzo(k)fluoranthene	S19-Jn20031	CP	%	118			70-130	Pass	
Chrysene	S19-Jn20031	CP	%	125			70-130	Pass	
Dibenz(a,h)anthracene	S19-Jn20031	CP	%	122			70-130	Pass	
Fluoranthene	S19-Jn20031	CP	%	126			70-130	Pass	
Fluorene	S19-Jn20031	CP	%	119			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S19-Jn20031	CP	%	121			70-130	Pass	
Naphthalene	S19-Jn20031	CP	%	105			70-130	Pass	
Phenanthrene	S19-Jn20031	CP	%	116			70-130	Pass	
Pyrene	S19-Jn20031	CP	%	120			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	S19-Jn19869	NCP	%	83			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S19-Jn16014	NCP	%	117			70-130	Pass	
Toxaphene	S19-Jn15708	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4,4'-DDD	S19-Jn20054	CP	%	126			70-130	Pass	
4,4'-DDE	S19-Jn20054	CP	%	116			70-130	Pass	
4,4'-DDT	S19-Jn20054	CP	%	118			70-130	Pass	
a-BHC	S19-Jn20054	CP	%	112			70-130	Pass	
Aldrin	S19-Jn20054	CP	%	112			70-130	Pass	
b-BHC	S19-Jn20054	CP	%	103			70-130	Pass	
d-BHC	S19-Jn20054	CP	%	116			70-130	Pass	
Dieldrin	S19-Jn20054	CP	%	115			70-130	Pass	
Endosulfan I	S19-Jn20054	CP	%	115			70-130	Pass	
Endosulfan II	S19-Jn20054	CP	%	122			70-130	Pass	
Endosulfan sulphate	S19-Jn20054	CP	%	120			70-130	Pass	
Endrin	S19-Jn20054	CP	%	112			70-130	Pass	
Endrin aldehyde	S19-Jn20054	CP	%	112			70-130	Pass	
Endrin ketone	S19-Jn20054	CP	%	114			70-130	Pass	
g-BHC (Lindane)	S19-Jn20054	CP	%	111			70-130	Pass	
Heptachlor	S19-Jn20054	CP	%	112			70-130	Pass	
Heptachlor epoxide	S19-Jn20054	CP	%	114			70-130	Pass	
Hexachlorobenzene	S19-Jn20054	CP	%	107			70-130	Pass	
Methoxychlor	S19-Jn20054	CP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Jn20056	CP	%	93			70-130	Pass	
TRH C10-C14	S19-Jn20056	CP	%	91			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Jn20056	CP	%	93			70-130	Pass	
Toluene	S19-Jn20056	CP	%	93			70-130	Pass	
Ethylbenzene	S19-Jn20056	CP	%	96			70-130	Pass	
m&p-Xylenes	S19-Jn20056	CP	%	97			70-130	Pass	
o-Xylene	S19-Jn20056	CP	%	97			70-130	Pass	
Xylenes - Total	S19-Jn20056	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	S19-Jn20056	CP	%	86			70-130	Pass	
TRH C6-C10	S19-Jn20056	CP	%	92			70-130	Pass	
TRH >C10-C16	S19-Jn20056	CP	%	94			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S19-Jn20056	CP	%	95			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Jn20069	CP	%	95			70-130	Pass	
Cadmium	S19-Jn20069	CP	%	88			70-130	Pass	
Chromium	S19-Jn20069	CP	%	88			70-130	Pass	
Copper	S19-Jn20069	CP	%	110			70-130	Pass	
Lead	S19-Jn20069	CP	%	102			70-130	Pass	
Mercury	S19-Jn20069	CP	%	89			70-130	Pass	
Nickel	S19-Jn20069	CP	%	89			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Jn14157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Jn14157	NCP	mg/kg	0.7	0.5	29	30%	Pass	
Anthracene	S19-Jn14157	NCP	mg/kg	1.4	1.1	19	30%	Pass	
Benz(a)anthracene	S19-Jn14157	NCP	mg/kg	5.5	4.5	21	30%	Pass	
Benzo(a)pyrene	S19-Jn14157	NCP	mg/kg	7.7	5.9	27	30%	Pass	
Benzo(b&j)fluoranthene	S19-Jn14157	NCP	mg/kg	5.2	4.2	22	30%	Pass	
Benzo(g,h,i)perylene	S19-Jn14157	NCP	mg/kg	5.9	4.5	26	30%	Pass	
Benzo(k)fluoranthene	S19-Jn14157	NCP	mg/kg	5.0	4.0	22	30%	Pass	
Chrysene	S19-Jn14157	NCP	mg/kg	6.2	4.9	24	30%	Pass	
Dibenz(a,h)anthracene	S19-Jn14157	NCP	mg/kg	1.5	1.2	23	30%	Pass	
Fluoranthene	S19-Jn14157	NCP	mg/kg	18	14	22	30%	Pass	
Fluorene	S19-Jn14157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	S19-Jn14157	NCP	mg/kg	4.7	3.6	25	30%	Pass	
Naphthalene	S19-Jn14157	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Jn14157	NCP	mg/kg	6.5	5.3	20	30%	Pass	
Pyrene	S19-Jn14157	NCP	mg/kg	15	12	23	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Jn20030	CP	%	7.2	7.1	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Jn20040	CP	%	13	14	10	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Jn20053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4,4'-DDD	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDE	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4,4'-DDT	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Endrin	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S19-Jn20053	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S19-Jn20053	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S19-Jn20053	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S19-Jn20055	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	S19-Jn10312	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S19-Jn10312	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S19-Jn10312	NCP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S19-Jn20055	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S19-Jn20055	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S19-Jn20055	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S19-Jn20055	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S19-Jn20055	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S19-Jn20055	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S19-Jn20055	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S19-Jn20055	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S19-Jn10312	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S19-Jn10312	NCP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S19-Jn10312	NCP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S19-Jn10312	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S19-Jn10312	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S19-Jn10312	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S19-Jn10312	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S19-Jn10312	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S19-Jn10312	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S19-Jn10312	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S19-Jn20059	CP	%	11	12	5.0	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S19-Jn20068	CP	mg/kg	4.5	5.6	<1	30%	Pass
Cadmium	S19-Jn20068	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S19-Jn20068	CP	mg/kg	10	11	6.0	30%	Pass
Copper	S19-Jn20068	CP	mg/kg	29	32	9.0	30%	Pass
Lead	S19-Jn20068	CP	mg/kg	78	86	10	30%	Pass
Mercury	S19-Jn20068	CP	mg/kg	< 0.1	0.1	16	30%	Pass
Nickel	S19-Jn20068	CP	mg/kg	5.9	6.3	6.0	30%	Pass
Zinc	S19-Jn20068	CP	mg/kg	78	78	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S19-Jn20083	CP	%	16	15	2.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
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
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)



Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: Aidan Rooney
Report 661368-AID
Project Name MEADOWBANK
Project ID 9280
Received Date Jun 18, 2019
Date Reported Jun 25, 2019

Methodology:

Asbestos Fibre
 Identification

Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques.

NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.

Unknown Mineral
 Fibres

Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity.

NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.

Subsampling Soil
 Samples

The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed.

NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.

Bonded asbestos-
 containing material
 (ACM)

The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination. The resultant material is then further examined in accordance with AS 4964 - 2004.

NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.

Limit of Reporting

The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w).

The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk).

NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos". This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.

Project Name MEADOWBANK
Project ID 9280
Date Sampled Jun 18, 2019
Report 661368-AID

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
SS03A_0.0-0.2	19-Jn20027	Jun 18, 2019	Approximate Sample 700g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS03B_0.0-0.2	19-Jn20028	Jun 18, 2019	Approximate Sample 684g Sample consisted of: Brown coarse-grained soil, rocks and fragments of bitumen	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
SS03C_0.5-0.7	19-Jn20029	Jun 18, 2019	Approximate Sample 526g Sample consisted of: Brown coarse-grained soil, rocks and coal-like material	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP30A_0.0-0.2	19-Jn20043	Jun 18, 2019	Approximate Sample 598g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP30A_1.7-1.9	19-Jn20044	Jun 18, 2019	Approximate Sample 803g Sample consisted of: Brown coarse-grained soil and rocks	AF: Chrysotile and crocidolite asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.0034g* Estimated asbestos content in AF = 0.0034g* Total estimated asbestos concentration in AF = 0.00042% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
TP30B_0.0-0.2	19-Jn20045	Jun 18, 2019	Approximate Sample 576g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
TP30B_0.9-1.1	19-Jn20046	Jun 18, 2019	Approximate Sample 663g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP30C_0.9-1.1	19-Jn20047	Jun 18, 2019	Approximate Sample 762g Sample consisted of: Brown coarse-grained soil, rocks and fragments of bitumen	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP30C_1.7-1.9	19-Jn20048	Jun 18, 2019	Approximate Sample 830g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH40C_0.1-0.3	19-Jn20049	Jun 18, 2019	Approximate Sample 705g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH40C_1.7-1.9	19-Jn20050	Jun 18, 2019	Approximate Sample 839g Sample consisted of: Brown coarse-grained soil, rocks and fragments of bitumen	No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected. No respirable fibres detected.
BH40D_0.0-0.2	19-Jn20051	Jun 18, 2019	Approximate Sample 768g Sample consisted of: Brown coarse-grained soil, rocks and fragments of bitumen	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
BH40D_0.9-1.1	19-Jn20052	Jun 18, 2019	Approximate Sample 726g Sample consisted of: Brown coarse-grained soil and rocks	AF: Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.0019g* Estimated asbestos content in AF = 0.0019g* Total estimated asbestos concentration in AF = 0.00026% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP49_0.0-0.2	19-Jn20055	Jun 18, 2019	Approximate Sample 593g Sample consisted of: Tan coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP50_0.0-0.2	19-Jn20056	Jun 18, 2019	Approximate Sample 670g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP51_0.0-0.2	19-Jn20057	Jun 18, 2019	Approximate Sample 673g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP51_0.8-1.0	19-Jn20058	Jun 18, 2019	Approximate Sample 808g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
TP52_0.0-0.2	19-Jn20059	Jun 18, 2019	Approximate Sample 711g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP52_1.2-1.4	19-Jn20060	Jun 18, 2019	Approximate Sample 515g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP53_0.9-1.1	19-Jn20061	Jun 18, 2019	Approximate Sample 506g Sample consisted of: Brown coarse-grained soil and rocks	FA: Chrysotile, amosite and crocidolite asbestos detected in weathered fibre cement fragments. Approximate raw weight of FA = 0.0026g Estimated asbestos content in FA = 0.0018g* Total estimated asbestos concentration in FA = 0.00036% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP54_0.0-0.2	19-Jn20062	Jun 18, 2019	Approximate Sample 491g Sample consisted of: Brown coarse-grained soil, rocks and fragments of bitumen	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP54_1.3-1.5	19-Jn20063	Jun 18, 2019	Approximate Sample 633g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
TP57_0.0-0.2	19-Jn20064	Jun 18, 2019	Approximate Sample 679g Sample consisted of: Brown coarse-grained soil and rocks	FA: Chrysotile asbestos detected in weathered fibre cement fragments. Approximate Raw weight of FA = 0.012g Estimated asbestos content in FA = 0.0074g* AF: Chrysotile asbestos detected in the form of loose fibre bundles. Approximate raw weight of AF = 0.0014g* Estimated asbestos content in AF = 0.0014g* Total estimated asbestos content in FA and AF = 0.0088g* Total estimated asbestos concentration in FA and AF = 0.0013% w/w* Organic fibre detected. No respirable fibres detected.
TP57_0.8-1.0	19-Jn20065	Jun 18, 2019	Approximate Sample 720g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.
FCS_TP30B	19-Jn20070	Jun 18, 2019	Approximate Sample 15g / 54x45x4mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.

Client Sample ID	Eurofins mgt Sample No.	Date Sampled	Sample Description	Result
FCS_TP30C	19-Jn20071	Jun 18, 2019	Approximate Sample 49g / 113x47x4mm Sample consisted of: Grey fibre cement material	Chrysotile asbestos detected.
FCS_TP40C	19-Jn20072	Jun 18, 2019	Approximate Sample 16g / 97x34x4mm Sample consisted of: Fibreglass material and green coating	No asbestos detected. Synthetic mineral fibre detected. No respirable fibres detected.

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 18, 2019	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Jun 18, 2019	Indefinite

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661368
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 18, 2019 4:21 PM
Due: Jun 25, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	SS03A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20027	X										
2	SS03B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20028	X										
3	SS03C_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20029	X										
4	TP16A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20030					X					X	
5	TP16A_1.6-1.7	Jun 18, 2019		Soil	S19-Jn20031					X					X	
6	TP16B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20032					X					X	
7	TP16B_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20033					X					X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
8	TP16C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20034					X					X	
9	TP16C_1.8-2.0	Jun 18, 2019		Soil	S19-Jn20035					X					X	
10	TP16D_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20036					X					X	
11	TP16D_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20037					X					X	
12	TP24A_0.1-0.4	Jun 18, 2019		Soil	S19-Jn20038				X						X	
13	TP24B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20039				X						X	
14	TP24B_0.3-0.5	Jun 18, 2019		Soil	S19-Jn20040				X						X	
15	TP24C_0.1-0.4	Jun 18, 2019		Soil	S19-Jn20041				X						X	
16	TP24D_0.1-	Jun 18, 2019		Soil	S19-Jn20042				X						X	

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
	0.4															
17	TP30A_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20043	X							X		X	
18	TP30A_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20044	X										
19	TP30B_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20045	X										
20	TP30B_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20046	X										
21	TP30C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20047	x										
22	TP30C_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20048	x										
23	BH40C_0.1-0.3	Jun 18, 2019		Soil	S19-Jn20049	x										
24	BH40C_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20050	x										

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
25	BH40D_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20051	X										
26	BH40D_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20052	X										
27	TP46_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20053						X		X		X	
28	TP46_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20054						X		X		X	
29	TP49_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20055	X				X	X	X	X	X	X	X
30	TP50_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20056	X				X	X	X	X	X	X	X
31	TP51_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20057	X				X	X	X	X	X	X	X
32	TP51_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20058	X				X	X	X	X	X	X	X
33	TP52_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20059	X				X	X	X	X	X	X	X
34	TP52_1.2-1.4	Jun 18, 2019		Soil	S19-Jn20060	X				X	X	X	X	X	X	X
35	TP53_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20061	X				X	X	X	X	X	X	X

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
36	TP54_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20062	X				X	X	X	X	X	X	X
37	TP54_1.3-1.5	Jun 18, 2019		Soil	S19-Jn20063	X				X	X	X	X	X	X	X
38	TP57_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20064	X				X	X	X	X	X	X	X
39	TP57_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20065	X										
40	DUP01	Jun 18, 2019		Soil	S19-Jn20066								X		X	
41	DUP02	Jun 18, 2019		Soil	S19-Jn20067								X		X	
42	DUP03	Jun 18, 2019		Soil	S19-Jn20068								X		X	
43	DUP04	Jun 18, 2019		Soil	S19-Jn20069								X		X	
44	FCS_TP30B	Jun 18, 2019		Building Materials	S19-Jn20070		X									
45	FCS_TP30C	Jun 18, 2019		Building Materials	S19-Jn20071		X									
46	FCS_TP40C	Jun 18, 2019		Building	S19-Jn20072		X									

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Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
				Materials												
47	TRIP SPIKE	Jun 18, 2019		Water	S19-Jn20073									X		
48	TRIP BLANK	Jun 18, 2019		Water	S19-Jn20074									X		
49	SS03A_0.5-0.7	Jun 18, 2019		Soil	S19-Jn20075			X								
50	SS03B_0.8-1.0	Jun 18, 2019		Soil	S19-Jn20076			X								
51	SS03C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20077			X								
52	TP16A_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20078			X								
53	TP16B_1.8-2.0	Jun 18, 2019		Soil	S19-Jn20079			X								
54	TP16C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20080			X								

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Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
55	TP30A_0.7-0.9	Jun 18, 2019		Soil	S19-Jn20081			X								
56	TP30B_1.6-1.8	Jun 18, 2019		Soil	S19-Jn20082			X								
57	TP30C_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20083								X		X	
58	BH40C_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20084			X								
59	BH40D_1.7-1.9	Jun 18, 2019		Soil	S19-Jn20085			X								
60	TP50_0.2-0.4	Jun 18, 2019		Soil	S19-Jn20086			X								
61	TP51_1.3-1.5	Jun 18, 2019		Soil	S19-Jn20087			X								
62	TP52_0.9-1.1	Jun 18, 2019		Soil	S19-Jn20088			X								
63	TP53_0.0-0.2	Jun 18, 2019		Soil	S19-Jn20089			X								
64	TP53_1.2-1.4	Jun 18, 2019		Soil	S19-Jn20090			X								

Company Name: Alliance Geotechnical
Address: 10 Welder Road
Seven Hills
NSW 2147
Project Name: MEADOWBANK
Project ID: 9280

Order No.:
Report #: 661368
Phone: 1800 288 188
Fax: 02 9675 1888

Received: Jun 18, 2019 4:21 PM
Due: Jun 25, 2019
Priority: 5 Day
Contact Name: Aidan Rooney

Eurofins | mgt Analytical Services Manager : Andrew Black

Sample Detail						Asbestos - WA guidelines	Asbestos Absence / Presence	HOLD	Lead	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 23736																
65	TP54_0.6-0.8	Jun 18, 2019		Soil	S19-Jn20091			X								
Test Counts						24	3	16	5	18	12	10	18	12	31	10

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

Units

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

Terms

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

Comments

S19-Jn20062: Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Laxman Dias Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu Senior Analyst-Asbestos (NSW)



Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

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CHAIN OF CUSTODY RECORD

Eurofins | mgt ABN 50 005 085 521

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☐ Perth Laboratory
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08 9251 9500 EnviroSampleWA@eurofins.com

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

Company		Alliance Geotechnical		Project No		9280		Project Manager		Aiden Rooney		Sampler(s)		Sam Scully	
Address				Project Name		Mendowbank		EDD Format		ESdL, EQdS etc		Handed over by			
Contact Name		Sam Scully		Analyses Where materials are requested, please specify "Total" or "Filtered" SUITE code must be used to attract SUITE pricing.		Asbestos NEPM PAH Held						Email for Invoice			
Phone No		0400 339 745										Email for Results			
Special Directions												Containers		Required Turnaround Time (TAT)	
Purchase Order												Change container type & size if necessary.		Default will be 5 days if not ticked.	
Quote ID No															
No	Client Sample ID	Sampled Date/Time dd/mm/yyyy hh:mm	Matrix Solid (S) Water (W)												
1	SS03A-0.0-0.2	18-6-19	Soil	X											
2	SS03A-0.5-0.7						X								
3	SS03B-0.0-0.2			X											
4	SS03B-0.8-1.0						X								
5	SS03C-0.0-0.2						X								
6	SS03C-0.5-0.7			X											
7	TP16A-0.0-0.2						X								
8	TP16A-0.7-0.9						X								
9	TP16A-1.6-1.8						X								
10	TP16B-0.0-0.2						X								
Total Counts															
Method of Shipment				<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Signature		Date		Time		Temperature	
						SAM Scully				18-6-19		4:21 PM		18.7	
Eurofins mgt Laboratory Use Only				Received By		Signature		Signature		Date		Time		Report No	
				Received By		Signature		Signature		Date		Time		Report No	
				hupan						18/06		4:21 PM		#661368	

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

Company		Alliance Geo		Project No		9280		Project Manager		Aiden Rooney		Sampler(s)		Sam Sully	
Address		welder Rd		Project Name		Meadowbank		EDD Format				Handed over by			
Contact Name		Sam Sully		Analyses Where metals are requested, please specify "Total" or "Filterable" SUITE code must be used to attract SUITE pricing.								Email for Invoice			
Phone No												Email for Results			
Special Directions															
Purchase Order															
Quote ID No															
No		Client Sample ID		Sampled Date/Time dd/mm/yy hh:mm		Matrix Solid (S) Water (W)		PAH		LEAD		Hold			
1		TP16B-0.9-1.1		18-6-19		Soil		X							
2		TP16B-1.8-2.0													
3		TP16C-0.0-0.2													
4		TP16C-0.9-1.1						X							
5		TP16C-1.8-2.0						X							
6		TP16D-0.0-0.2						X							
7		TP16D-0.7-0.9						X							
8		TP24A-0.1-0.4						X							
9		TP24B-0.0-0.2						X							
10		TP24B-0.3-0.5						X							
Total Counts															
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Sam Sully		Signature				Date		18-6-19	
Eurofins mgt Laboratory Use Only		Received By		Signature				Date		18/06		Time		4:21 PM	
		Received By		Signature				Date				Time		Report No	

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03 8564 5000 EnviroSampleVIC@eurofins.com

Company		Alliance Geotechnical		Project No		9280		Project Manager		Aiden Roney		Sampler(s)		Sam Sully	
Address		welders Rd		Project Name		meadowbank		EDD Format		ES&A, EQ&S etc		Handed over by			
Contact Name		Sam Sully		Analytes While metals are requested, please specify 'Total' or 'Filtered'. SUIT E code must be used to attract SUITE pricing.		LEAD		ASBESTOS		NEAM		H/d		Email for Invoice	
Phone No		Email for Results													
Special Directions															
Purchase Order															
Quote ID No												Containers		Required Turnaround Time (TAT)	
												Change container type & size if necessary.		Default will be 5 days if not ticked	
												500mL Plastic		✦ Surcharge will apply	
												250mL Plastic		<input type="checkbox"/> Overnight (reporting by 9am) ✦	
												125mL Plastic		<input type="checkbox"/> Same day ✦ <input type="checkbox"/> 1 day ✦	
												200mL Amber Glass		<input type="checkbox"/> 2 days ✦ <input type="checkbox"/> 3 days ✦	
												40mL VOA vial		<input checked="" type="checkbox"/> days (Standard)	
												500mL PFAS Bottle		<input type="checkbox"/> Other ()	
												Jar (Glass or HDPE)			
												Other (Asbestos AS4564, WA Guidelines)			
														Sample Comments / Dangerous Goods Hazard Warning	
No	Client Sample ID	Sampled Date/Time dd/mm/yyyy hh:mm	Matrix Solid (S) Water (W)												
1	TP24C-0.1-0.4	18-6-19	Soil	X											
2	TP24D-0.1-0.4			X											
3	TP30A-0.0-0.2				X										
4	TP30A-0.7-0.9					X									
5	TP30A-1.7-1.9				X										
6	TP30B-0.0-0.2				X										
7	TP30B-0.9-1.1				X										
8	TP30B-1.6-1.8					X									
9	TP30C-0.0-0.2					X									
10	TP30C-0.9-1.1				X										
Total Counts															
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Sam Sully		Signature				Date		18-6-19	
												Time		4pm	
Eurofins mgt Laboratory Use Only		Received By		Signature		Signature		Date		18/06		Time		4:21 PM	
		Received By		Signature		Signature		Date				Time		Report No	



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☐ Melbourne Laboratory

6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVIC@eurofins.com

Company		Alliance Geotech		Project No		9280		Project Manager		Aidan Reaney		Sampler(s)		Sam Scully											
Address				Project Name		Meadarbyn		EDD Format		ESol, EQulS etc		Handed over by													
Contact Name		Sam Scully		Analyses Where results are requested, please specify "Total" or "Filtered". SUITE code must be used to allocate SUITE pricing.		Asbestos NERM		OCp		Metals		TRH		BTEX		PAH		PCB		H/d		Email for Invoice			
Phone No																						Email for Results			
Special Directions																						Containers		Required Turnaround Time (TAT)	
Purchase Order																						Change container type & size if necessary.		Default will be 5 days if not ticked.	
Quote ID No																									
No	Client Sample ID	Sampled Date/Time	Matrix																						
		dd/mm/yyyy hh:mm	Solid (S) Water (W)																						
1	TP30C-1.7-1.9	18-6-19	S.1	X																					
2	BH40C-0.1-0.3			X																					
3	BH40C-0.9-1.1									X															
4	BH40C-1.7-1.9			X																					
5	BH40D-0.0-0.2			X																					
6	BH40D-0.9-1.1			X																					
7	BH40D-1.7-1.9									X															
8	TP46-0.0-0.2					X	X																		
9	TP46-0.5-0.7					X	X																		
10	TP49-0.0-0.2			X	X	X	X	X	X	X	X														
Total Counts																									
Method of Shipment				<input type="checkbox"/> Courier (#)		<input checked="" type="checkbox"/> Hand Delivered		<input type="checkbox"/> Postal		Name		Sam Scully		Signature		Date		18-6-19		Time		4pm			
Eurofins mgt Laboratory Use Only				Received By		Pupen		SYD BNE MEL PER ADL NTL DRW		Signature				Date		18/06		Time		4:21 PM		Temperature			
				Received By				SYD BNE MEL PER ADL NTL DRW		Signature				Date				Time				Report No			

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☐ Melbourne Laboratory
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03 8564 5000 EnviroSampleVIC@eurofins.com

Company		Alliance Geotechnical		Project No		9280		Project Manager		Aidan Rooney		Sampler(s)		Sam Sally											
Address				Project Name		Meadowbank		EDD Format		ESdet, EQulS etc		Handed over by													
Contact Name		Sam Sally		Analyses Where metals are requested, please specify 'Total' or 'Filtered' SUITE code must be used to direct SUITE pricing.		Asbestos NEPM		OC		Metals		TRI		BTEX		PAH		PCB		H/d		Containers Change container type & size if necessary.		Required Turnaround Time (TAT) Default will be 5 days if not ticked.	
Phone No																									
Special Directions																									
Purchase Order																									
Quote ID No																									
No	Client Sample ID	Sampled Date/Time dd/mm/yyyy hh:mm	Matrix Solid (S) Water (W)																						
1	TP50-0.0-0.2	18-6-19	Soil	X	X	X	X	X	X	X	X														
2	TP50-0.2-0.4																								
3	TP51-0.0-0.2			X	X	X	X	X	X	X	X														
4	TP51-0.8-1.0			X	X	X	X	X	X	X	X														
5	TP51-1.3-1.5																								
6	TP52-0.0-0.2			X	X	X	X	X	X	X	X														
7	TP52-0.9-1.1																								
8	TP52-1.2-1.4			X	X	X	X	X	X	X	X														
9	TP53-0.0-0.2																								
10	TP53-0.9-1.1			X	X	X	X	X	X	X	X														
Total Counts																									
Method of Shipment		<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Sam Sally		Signature				Date		18-6-19		Time		4pm							
Eurofins mgt Laboratory Use Only		Received By		hupen		SYD BNE MEL PER ADL NTL DRW		Signature				Date		19/06		Time		4:21PM		Temperature					
		Received By				SYD BNE MEL PER ADL NTL DRW		Signature				Date				Time				Report No					

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

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

Company		Alliance Geotechnical		Project No		9280		Project Manager		Adn Rooney		Sampler(s)		Sam Scully											
Address				Project Name		Meadowbank		EDD Format		ESdat, EQulS etc		Handed over by													
Contact Name		Sam Scully		Analyses Where metals are requested, please specify 'Total' or 'Filtered' SUITE code must be used to attract SUITE pricing								Email for Invoice													
Phone No												Email for Results													
Special Directions																									
Purchase Order																									
Quote ID No																									
No		Client Sample ID		Sampled Date/Time dd/mm/yyyy hh:mm		Matrix Solid (S) Water (W)		Metals (8)		TRH		BTE1		PAH		DUP		PCB		Asbestos		NEPM		Hold	
1		TP53-1.2-1.4		18-6-19		Soil																			
2		TP54-0.0-0.2						X		X		X		X		X		X		X					
3		TP54-0.6-0.8																							
4		TP54-1.3-1.5						X		X		X		X		X		X		X					
5		TP57-0.0-0.2						X		X		X		X		X		X		X					
6		TP57-0.8-1.0																							
7		DUP-01						X																	
8		DUP-01A						X																	
9		DUP-02						X																	
10		DUP-2A						X																	



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☐ Melbourne Laboratory
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03 8554 5000 EnviroSampleVic@eurofins.com

Company		Alliance Geotechnical		Project No		9280		Project Manager		Aden Reaney		Sampler(s)		Sam Scully	
Address				Project Name		Meadowbank		EDD Format		ESdnt, EQuiSetc		Handed over by			
Contact Name		Sam Scully		Analyses Where initially requested, please specify 'Total' or 'Filtered'. SUITE code must be used to attach SUITE pricing.		Metals (8) Asbestos 1-b BTX						Email for Invoice			
Phone No												Email for Results			
Special Directions												Containers		Required Turnaround Time (TAT)	
Purchase Order												Change container type & size, if necessary		Default will be 5 days if not ticked	
Quote ID No															
No	Client Sample ID	Sampled Date/Time	Matrix Solid (S) Water (W)												
1	Dup - 03	18-6-19	Soil	X											
2	Dup - 3A			X											
3	Dup - 04			X											
4	Dup - 4A			X											
5	FCS - TP30B		FRAG		X										
6	FCS - TP30c		FRAG		X										
7	FCS - TP40C		FRAG		X										
8	TRIP SPIKE		WATER			X									
9	TRIP BLANK		WATER			X									
10															
Total Counts															
Method of Shipment		<input type="checkbox"/> Courier #) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal		Name		Sam Scully		Signature				Date		18-6-19	
Eurofins mgt Laboratory Use Only		Received By		Signature				Date		18/06		Time		4:21 PM	
		Received By		Signature				Date				Time		Report No	

Enviro Sample NSW

From: Sam Scully <sam@allgeo.com.au>
Sent: Thursday, 20 June 2019 1:04 PM
To: Enviro Sample NSW
Subject: RE: Eurofins | mgt Sample Receipt Advice - Report 661368 : Site MEADOWBANK (9280)

Follow Up Flag: Follow up
Flag Status: Flagged

Thanks,

Could we please get the following soil samples analysed for metals on a 5 day TAT:

1. TP30A-0.0-0.2; and
2. TP30C-0.0-0.2.

Please do not hesitate to contact me if you have any queries or questions,

Kind Regards,

Sam Scully

Environmental Consultant - 0400 339 745 | Email: sam@allgeo.com.au

 Alliance Geotechnical ENGINEERING ENVIRONMENTAL TESTING Your On-Site Geotechnical & Environmental Specialists	 OHSAS18001 ISO9001 ISO14001 AS/NZS4801 OH&S QUALITY ENVIRONMENT OH&S
Office Email: admin@allgeo.com.au - Website: allgeo.com.au - Office Phone: 1800 288 188 Postal Address: PO Box 275, Seven Hills NSW 1730 / Office & Laboratory Address: 10 Welder Road, Seven Hills NSW 2147	

From: EnviroSampleNSW@eurofins.com <EnviroSampleNSW@eurofins.com>
Sent: Wednesday, 19 June 2019 5:03 PM
To: Aidan Rooney <aidan@allgeo.com.au>
Cc: Sam Scully <sam@allgeo.com.au>
Subject: Eurofins | mgt Sample Receipt Advice - Report 661368 : Site MEADOWBANK (9280)

Dear Valued Client,

DUP01A, DUP02A, DUP03A AND DUP04A SENT TO ALS|

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Regards

Elvis Dsouza

Sample Receipt

Eurofins | mgt

Unit F3, Parkview Building

16 Mars Road

LANE COVE WEST NSW 2066

AUSTRALIA

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APPENDIX E

ProUCL CALCULATIONS – LEAD SAMPLES

1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation			ProUCL 5.11/07/2019 12:27:38 PM								
5	From File			WorkSheet.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	Lead - ProUCL											
12												
13	General Statistics											
14	Total Number of Observations			10	Number of Distinct Observations			9				
15					Number of Missing Observations			0				
16	Minimum			7.3	Mean			205				
17	Maximum			490	Median			155				
18	SD			161.2	Std. Error of Mean			50.96				
19	Coefficient of Variation			0.786	Skewness			0.911				
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic			0.872	Shapiro Wilk GOF Test							
23	5% Shapiro Wilk Critical Value			0.842	Data appear Normal at 5% Significance Level							
24	Lilliefors Test Statistic			0.286	Lilliefors GOF Test							
25	5% Lilliefors Critical Value			0.262	Data Not Normal at 5% Significance Level							
26	Data appear Approximate Normal at 5% Significance Level											
27												
28	Assuming Normal Distribution											
29	95% Normal UCL				95% UCLs (Adjusted for Skewness)							
30	95% Student's-t UCL			298.4	95% Adjusted-CLT UCL (Chen-1995)			304.5				
31					95% Modified-t UCL (Johnson-1978)			300.9				
32												
33	Gamma GOF Test											
34	A-D Test Statistic			0.453	Anderson-Darling Gamma GOF Test							
35	5% A-D Critical Value			0.743	Detected data appear Gamma Distributed at 5% Significance Level							
36	K-S Test Statistic			0.232	Kolmogorov-Smirnov Gamma GOF Test							
37	5% K-S Critical Value			0.272	Detected data appear Gamma Distributed at 5% Significance Level							
38	Detected data appear Gamma Distributed at 5% Significance Level											
39												
40	Gamma Statistics											
41	k hat (MLE)			1.281	k star (bias corrected MLE)			0.963				
42	Theta hat (MLE)			160.1	Theta star (bias corrected MLE)			212.9				
43	nu hat (MLE)			25.61	nu star (bias corrected)			19.26				
44	MLE Mean (bias corrected)			205	MLE Sd (bias corrected)			208.9				
45					Approximate Chi Square Value (0.05)			10.31				
46	Adjusted Level of Significance			0.0267	Adjusted Chi Square Value			9.192				
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))			383.1	95% Adjusted Gamma UCL (use when n<50)			429.7				
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic			0.838	Shapiro Wilk Lognormal GOF Test							

	A	B	C	D	E	F	G	H	I	J	K	L	
53	5% Shapiro Wilk Critical Value					0.842	Data Not Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic					0.295	Lilliefors Lognormal GOF Test						
55	5% Lilliefors Critical Value					0.262	Data Not Lognormal at 5% Significance Level						
56	Data Not Lognormal at 5% Significance Level												
57													
58	Lognormal Statistics												
59	Minimum of Logged Data					1.988	Mean of logged Data					4.884	
60	Maximum of Logged Data					6.194	SD of logged Data					1.232	
61													
62	Assuming Lognormal Distribution												
63	95% H-UCL					1240	90% Chebyshev (MVUE) UCL					563.9	
64	95% Chebyshev (MVUE) UCL					705	97.5% Chebyshev (MVUE) UCL					900.9	
65	99% Chebyshev (MVUE) UCL					1286							
66													
67	Nonparametric Distribution Free UCL Statistics												
68	Data appear to follow a Discernible Distribution at 5% Significance Level												
69													
70	Nonparametric Distribution Free UCLs												
71	95% CLT UCL					288.9	95% Jackknife UCL					298.4	
72	95% Standard Bootstrap UCL					285.6	95% Bootstrap-t UCL					348.3	
73	95% Hall's Bootstrap UCL					401.6	95% Percentile Bootstrap UCL					293.3	
74	95% BCA Bootstrap UCL					294.3							
75	90% Chebyshev(Mean, Sd) UCL					357.9	95% Chebyshev(Mean, Sd) UCL					427.2	
76	97.5% Chebyshev(Mean, Sd) UCL					523.3	99% Chebyshev(Mean, Sd) UCL					712.1	
77													
78	Suggested UCL to Use												
79	95% Student's-t UCL					298.4							
80													
81	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test												
82	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL												
83													
84	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
85	Recommendations are based upon data size, data distribution, and skewness.												
86	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).												
87	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
88													

